

A Cooke's Tour of some recent Parasitology cases

Professor Robin A. Cooke



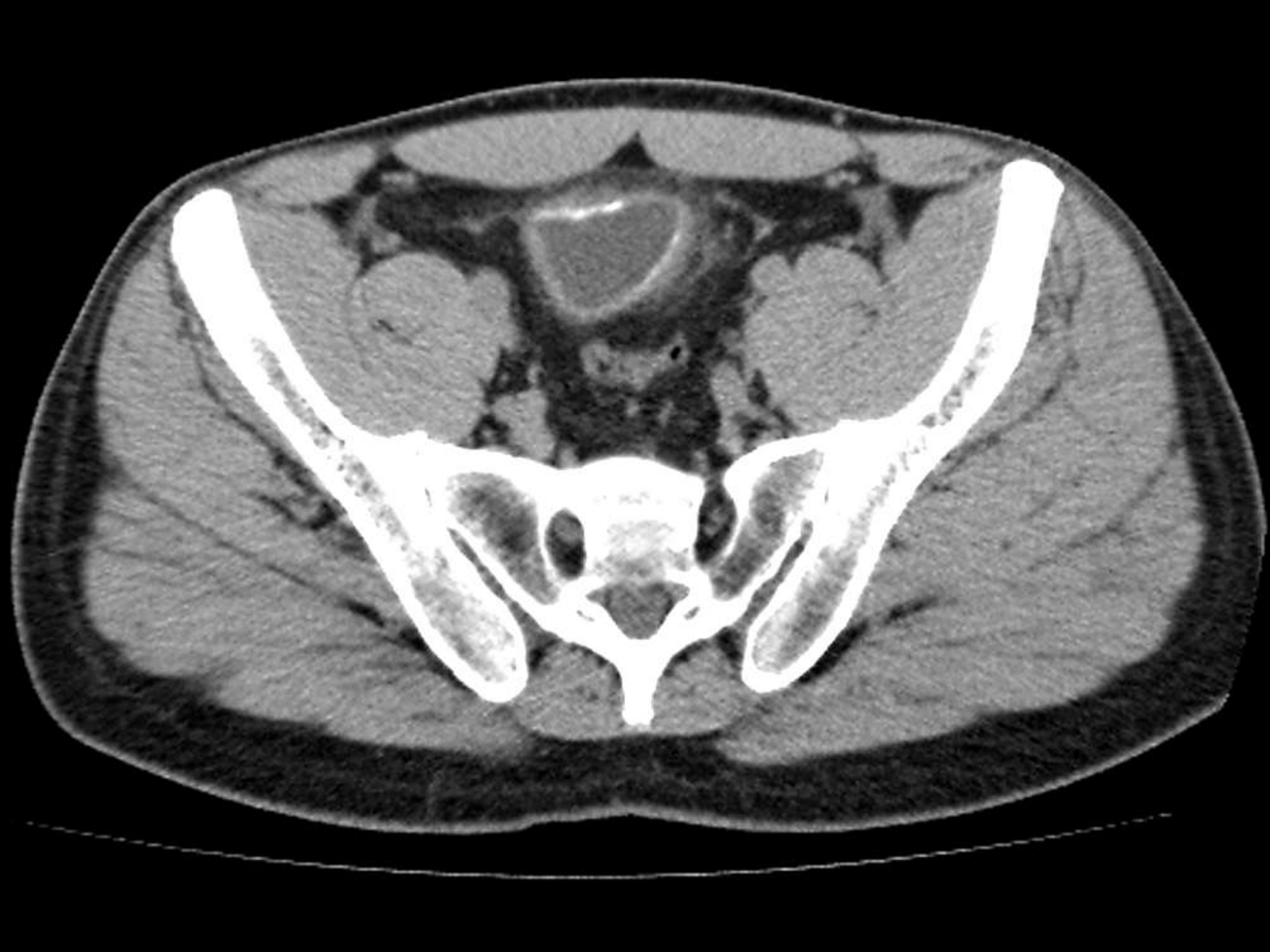
Schistosomiasis

A black male aged 43 years who spoke very little English presented in Dec 2008 complaining of back pain which he thought was caused by his work at the abattoir.

He had immigrated from Liberia 2 years ago.

CT examination showed some calcification in the dome of the bladder. 'Could this be schistosomiasis?'



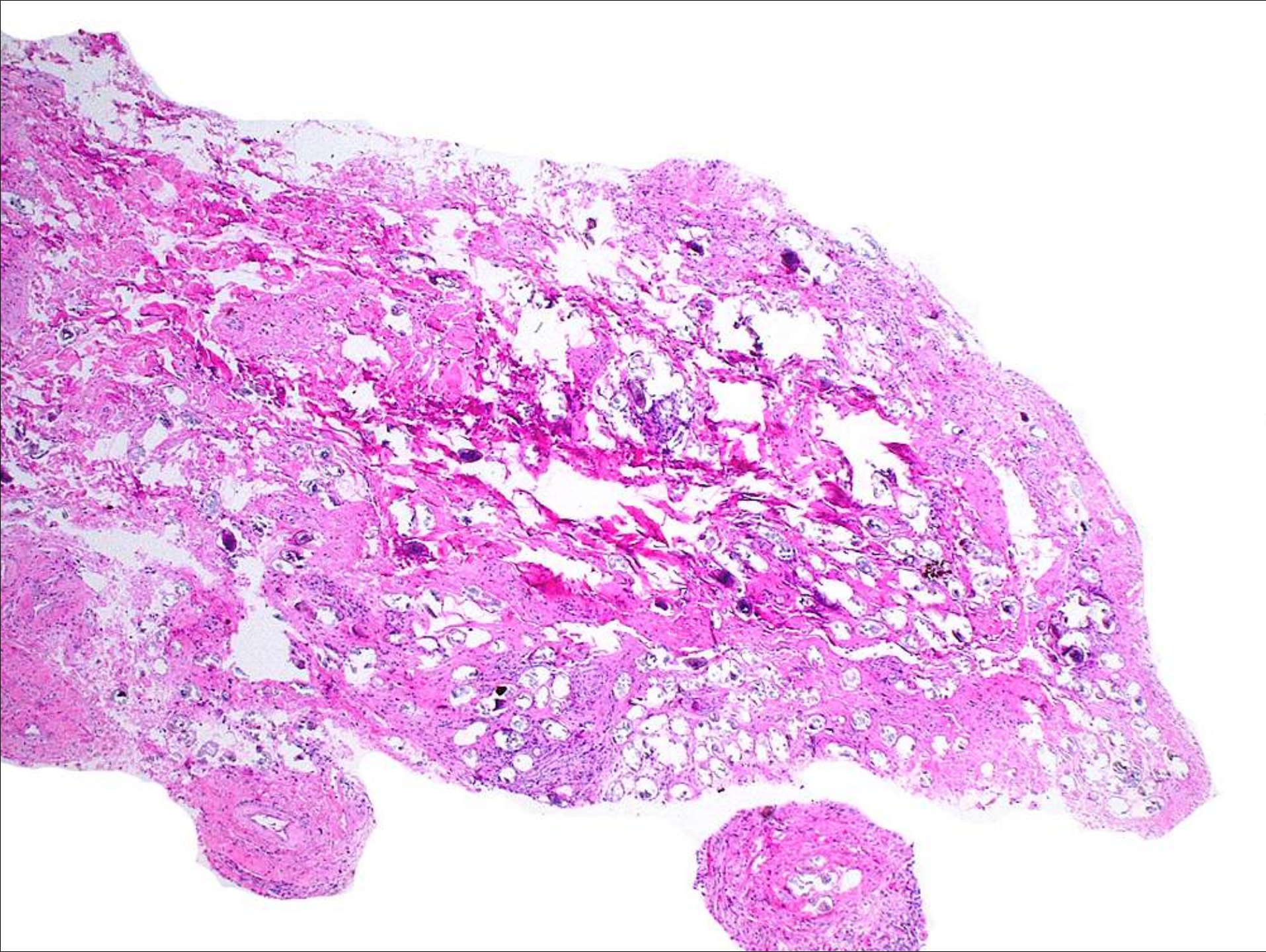


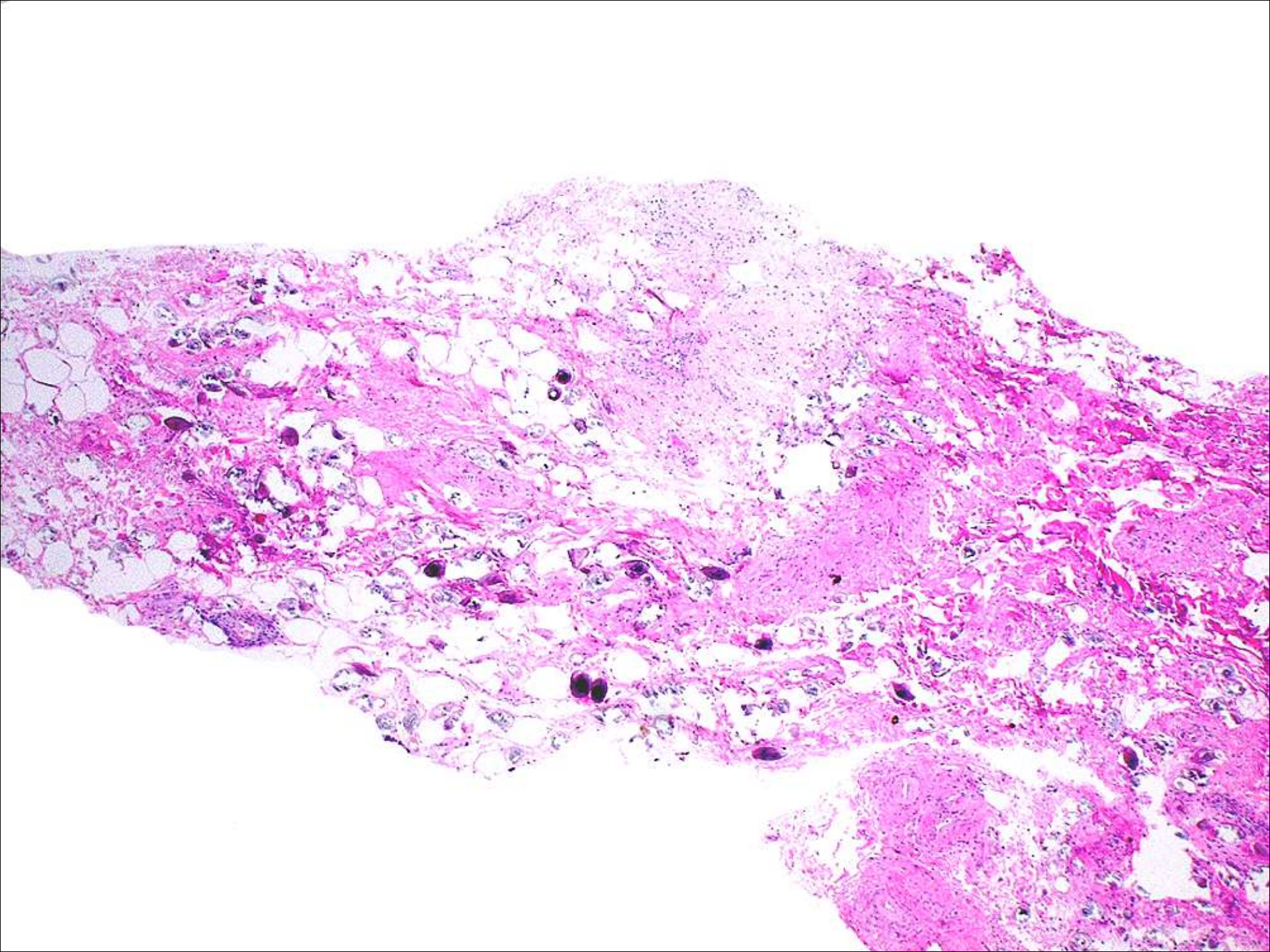
Cystoscopy showed multiple red areas on the bladder mucosa.

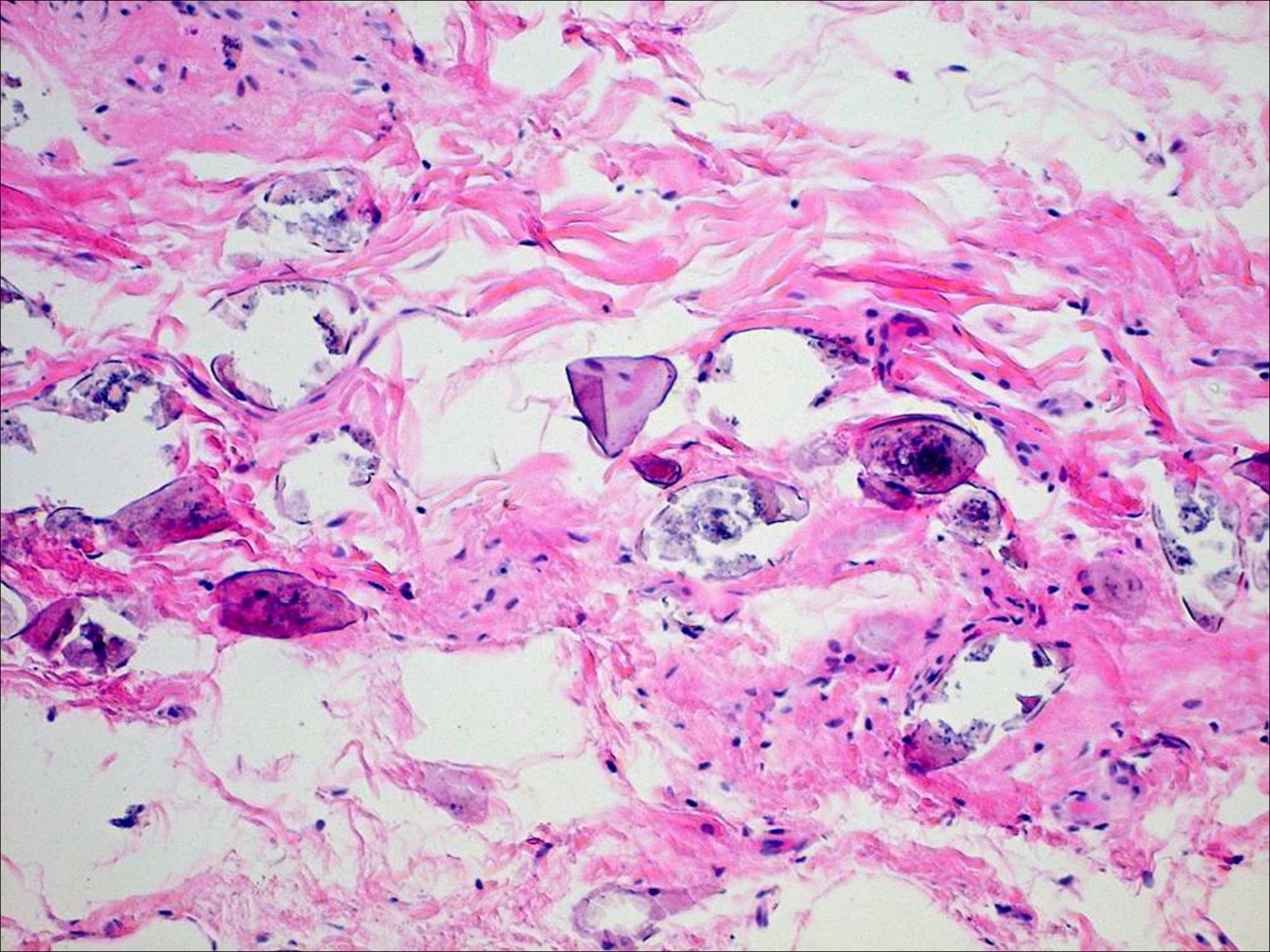
One of these red areas was biopsied and sent to the pathologist with the history 'bladder dysfunction.'

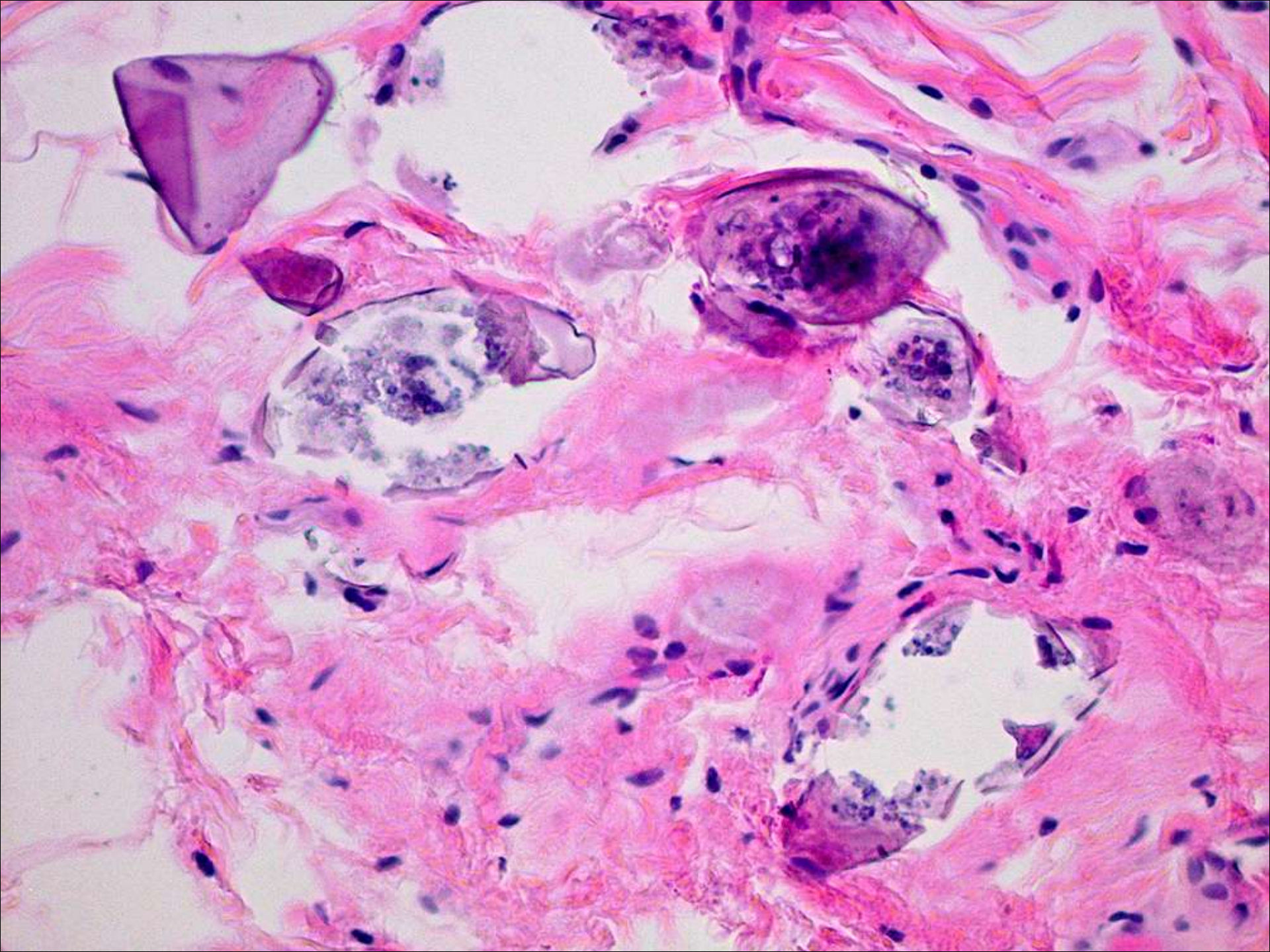
The biopsy was reported as showing the presence of rather degenerate schistosome ova.

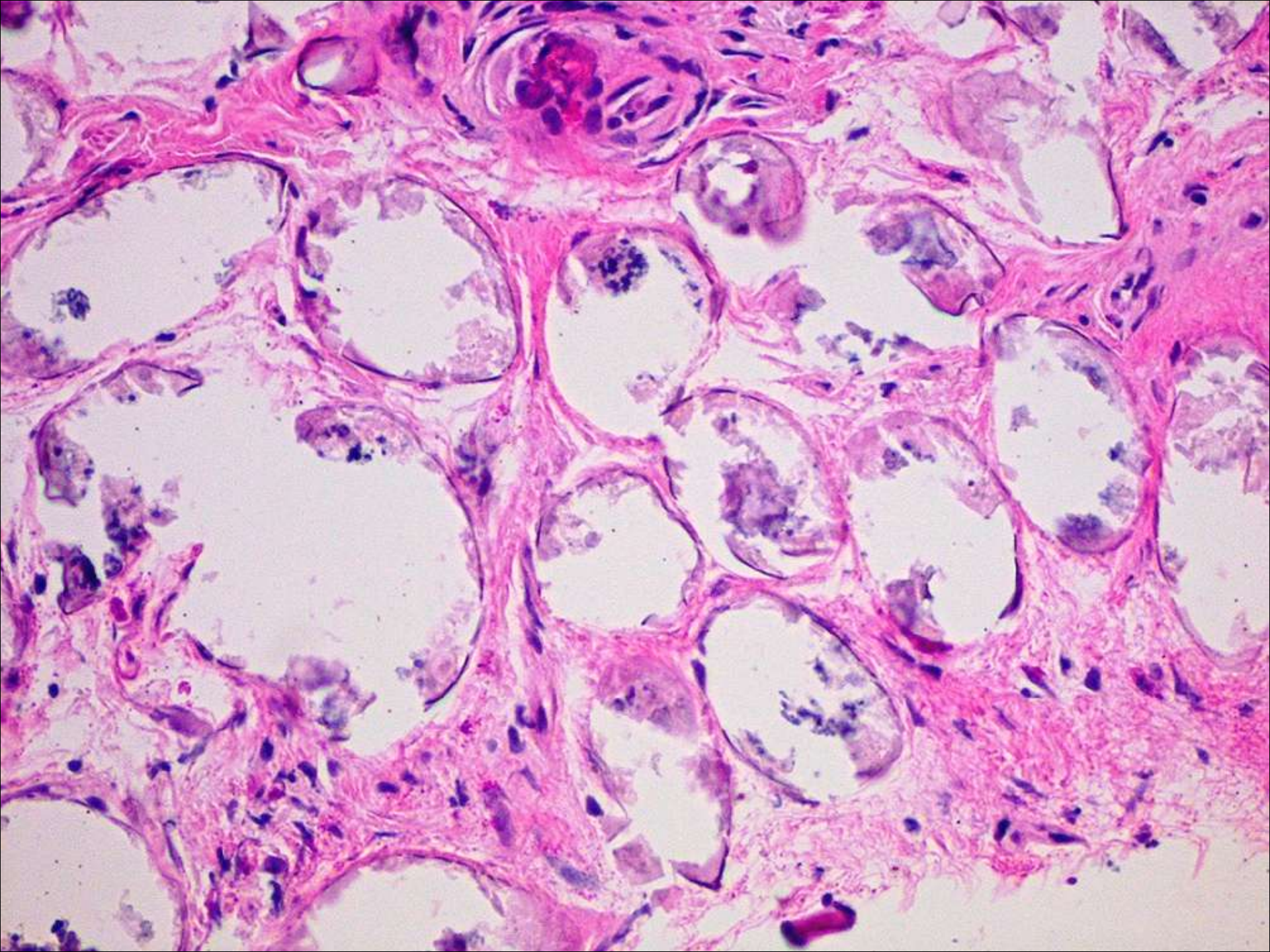
He was given a short course of Praziquantel.

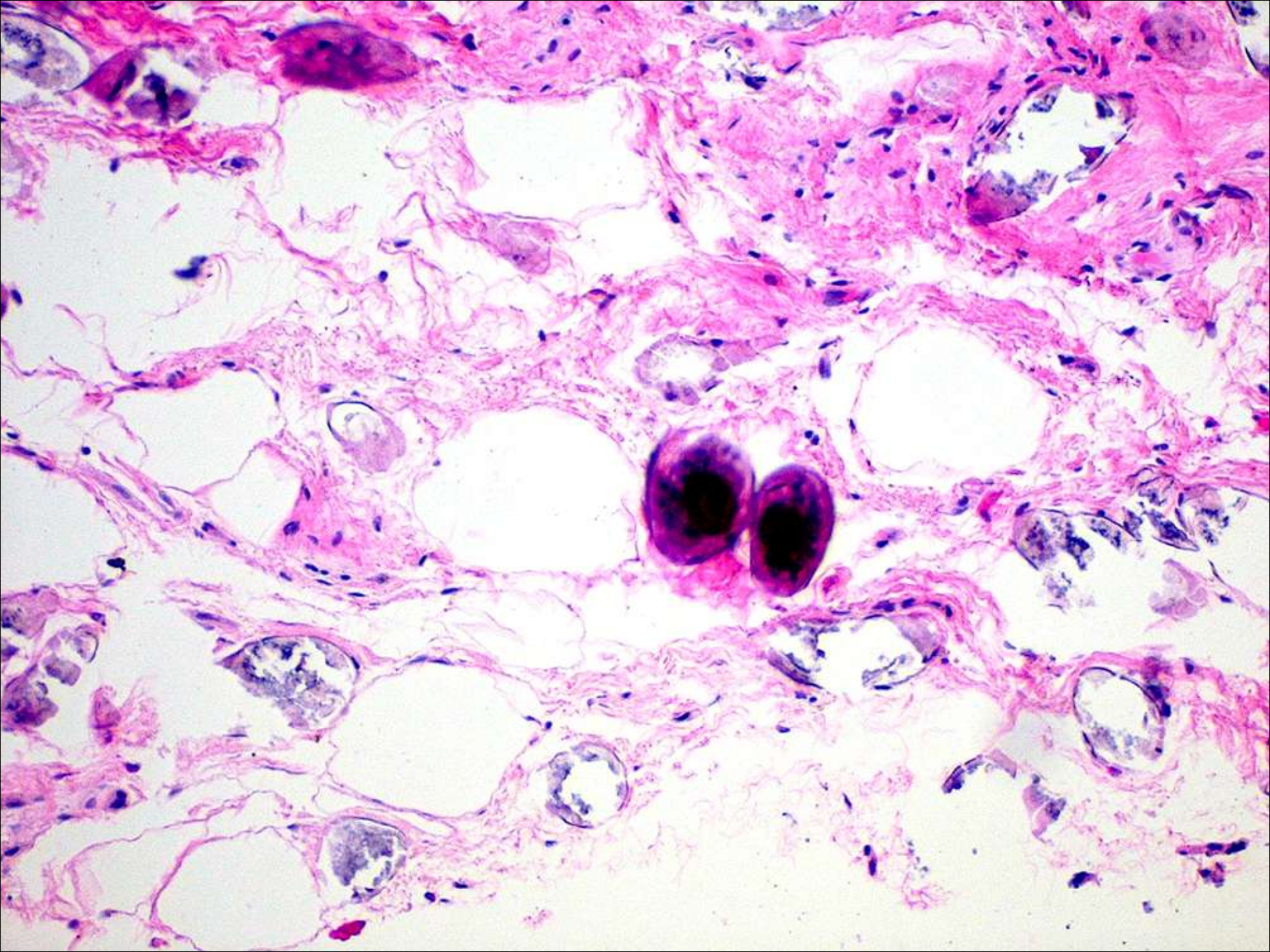


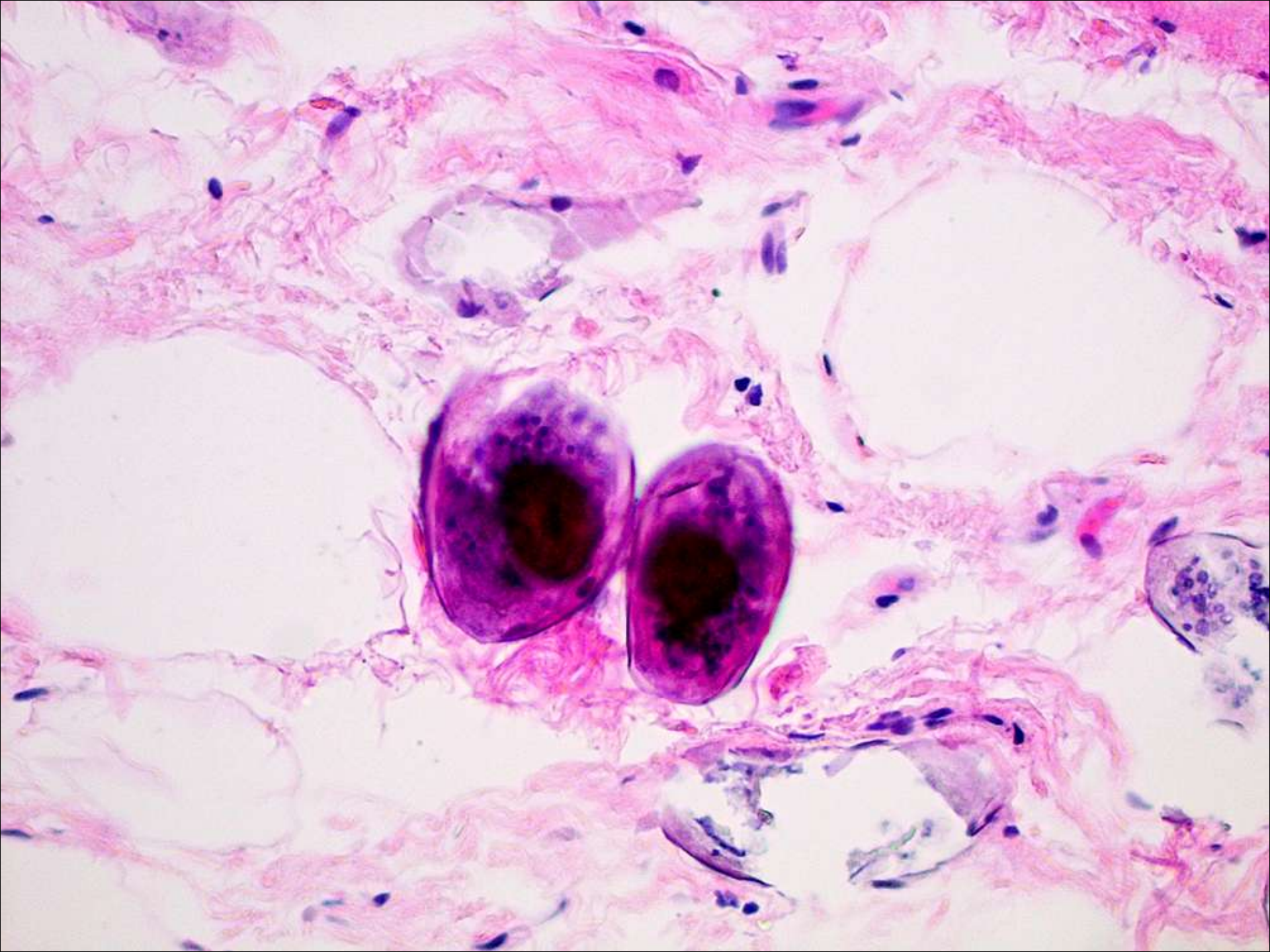


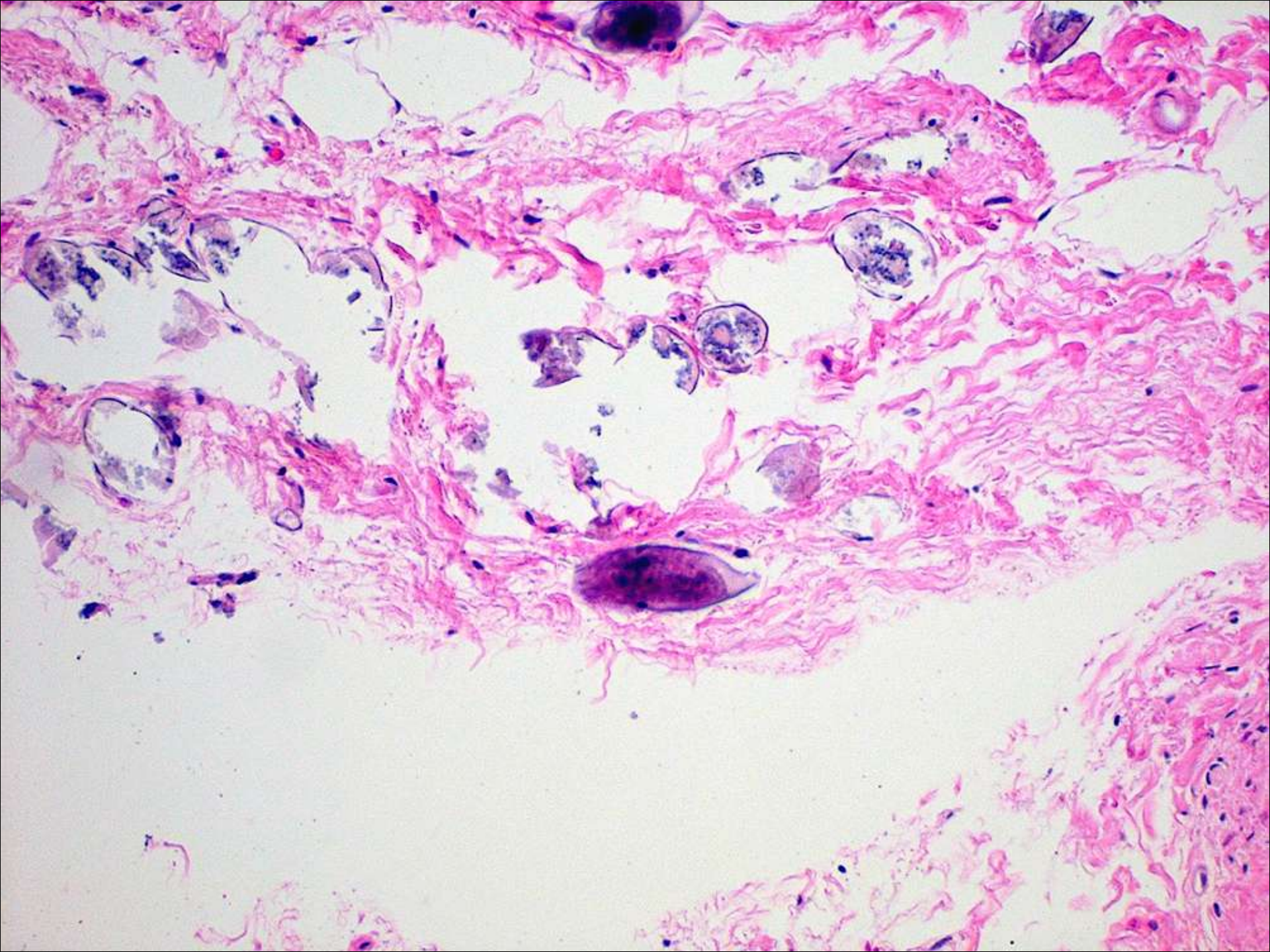




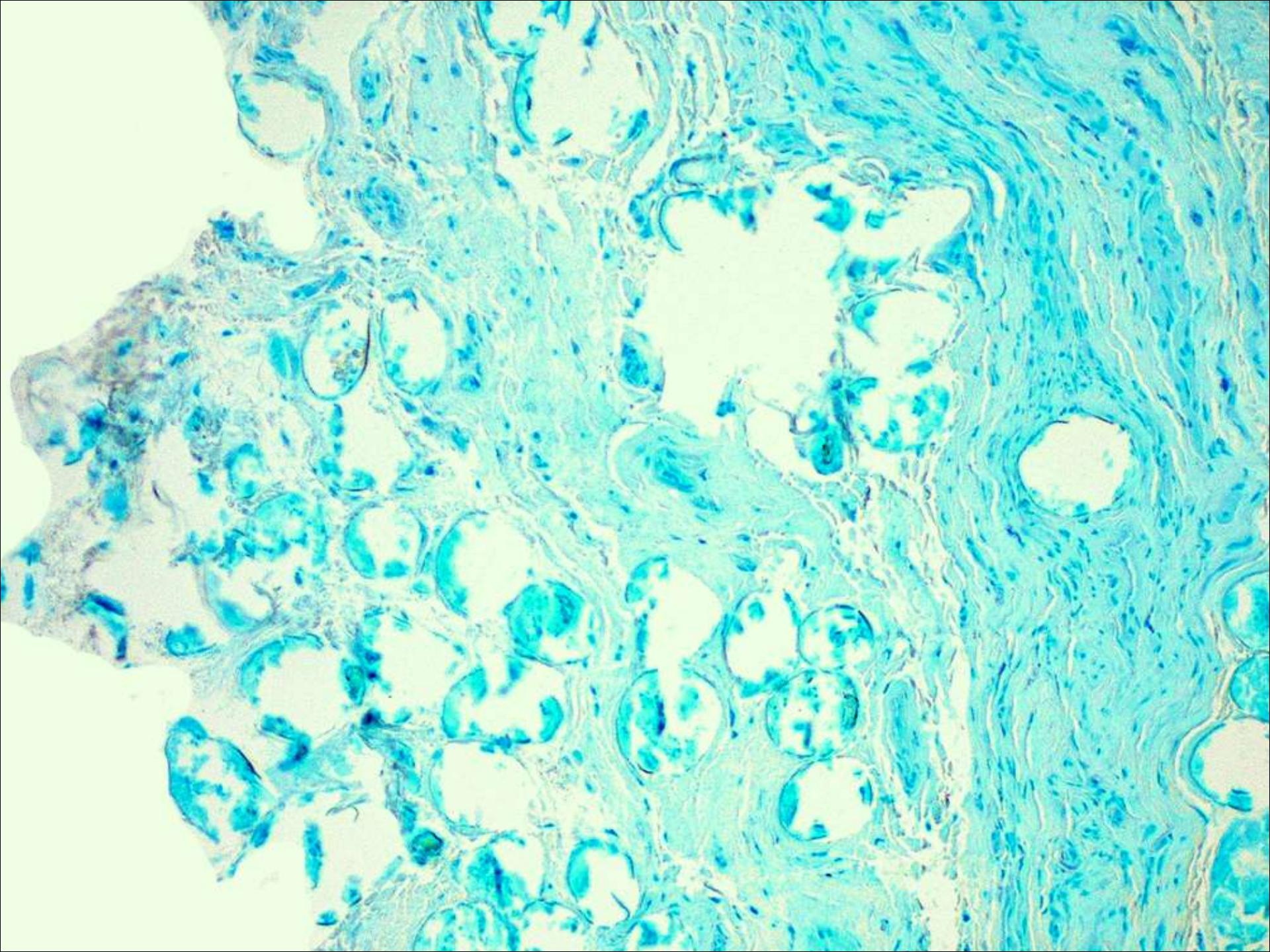


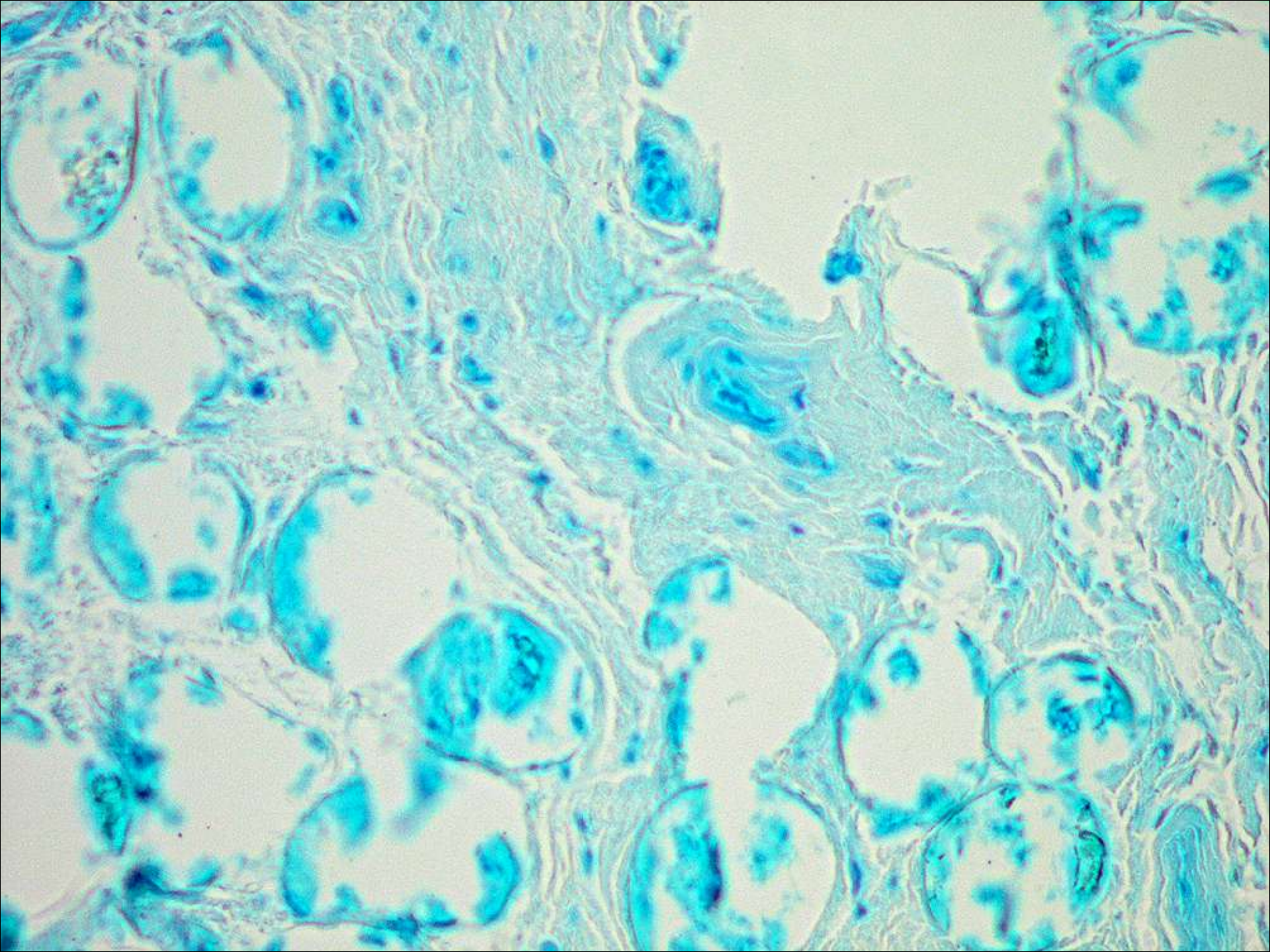












Further history:

His full blood count was normal.

(no eosinophilia)

His micro urine showed no abnormality.

In particular, no schistosome ova were seen.

His schistosome a.b. test was negative.

He was referred to the Infectious Diseases Clinic where he had a series of tests that are currently done on refugees.

Results were as follows:

HIV neg, Hep C neg, Hep B sab pos,
Hep B sag Neg, Strongyloides neg

Through an interpreter it was found that he was worried about erectile problems during intercourse.

He was sent to the Sexual Health Clinic where such problems had been found in a number of recent refugees.

He was treated for this.

He missed a few subsequent follow up appointments, but when he finally returned he was very happy because his erectile problems were cured.

He was diagnosed as having schistosomiasis and was given a course of Praziquantel,

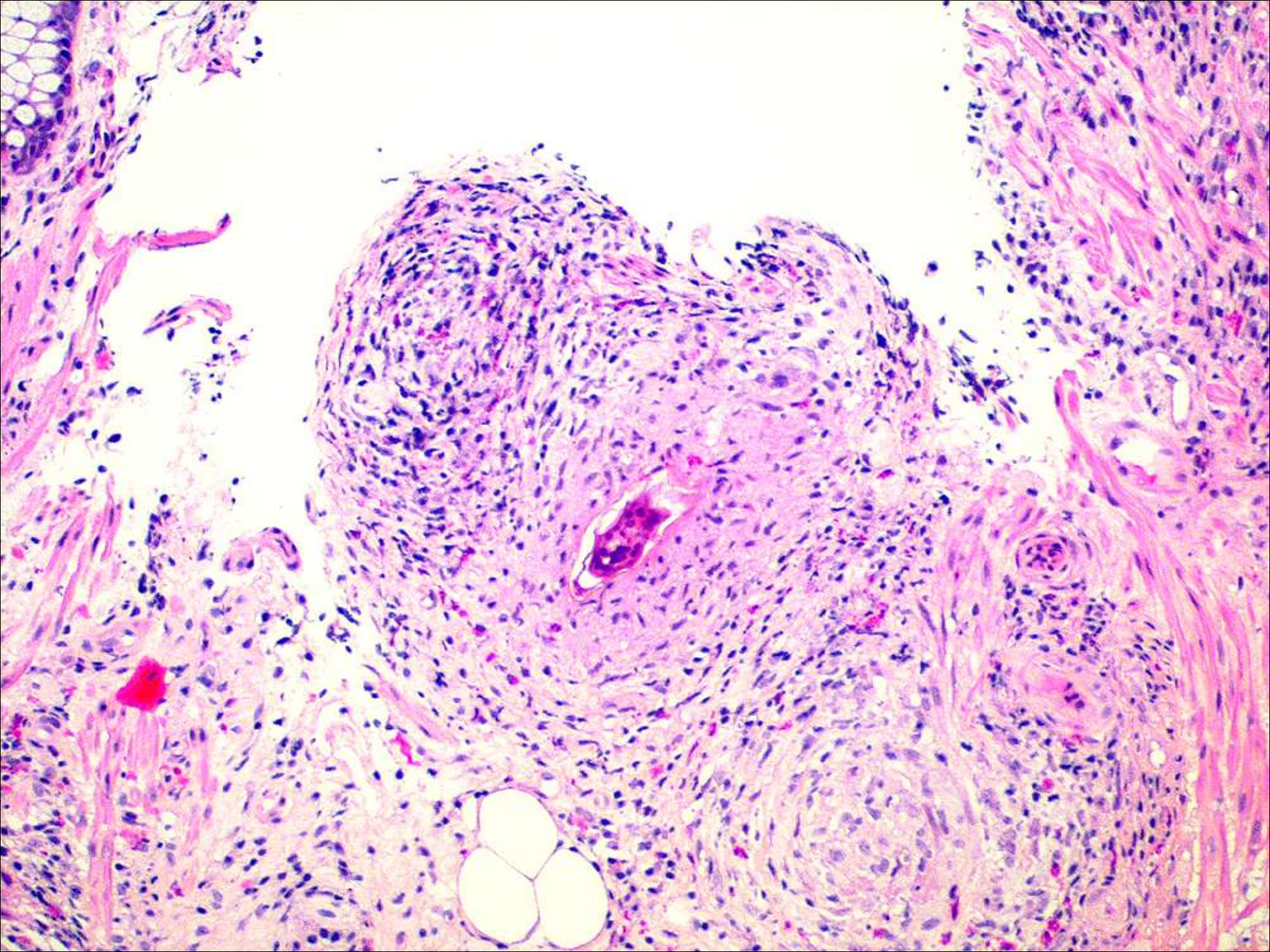
But was this necessary?

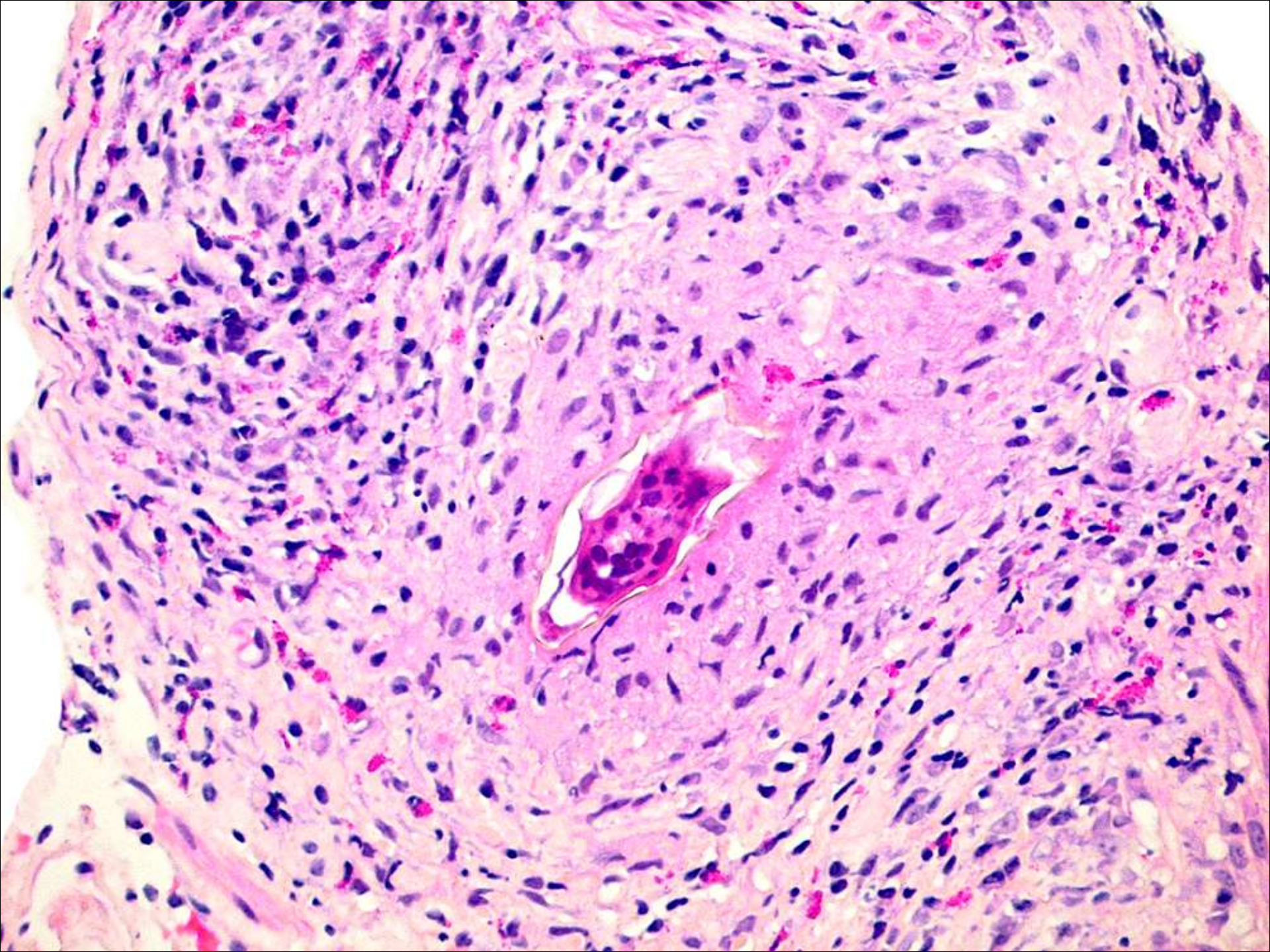
A white South African male aged 45 years presented with rectal bleeding in Dec 2008.

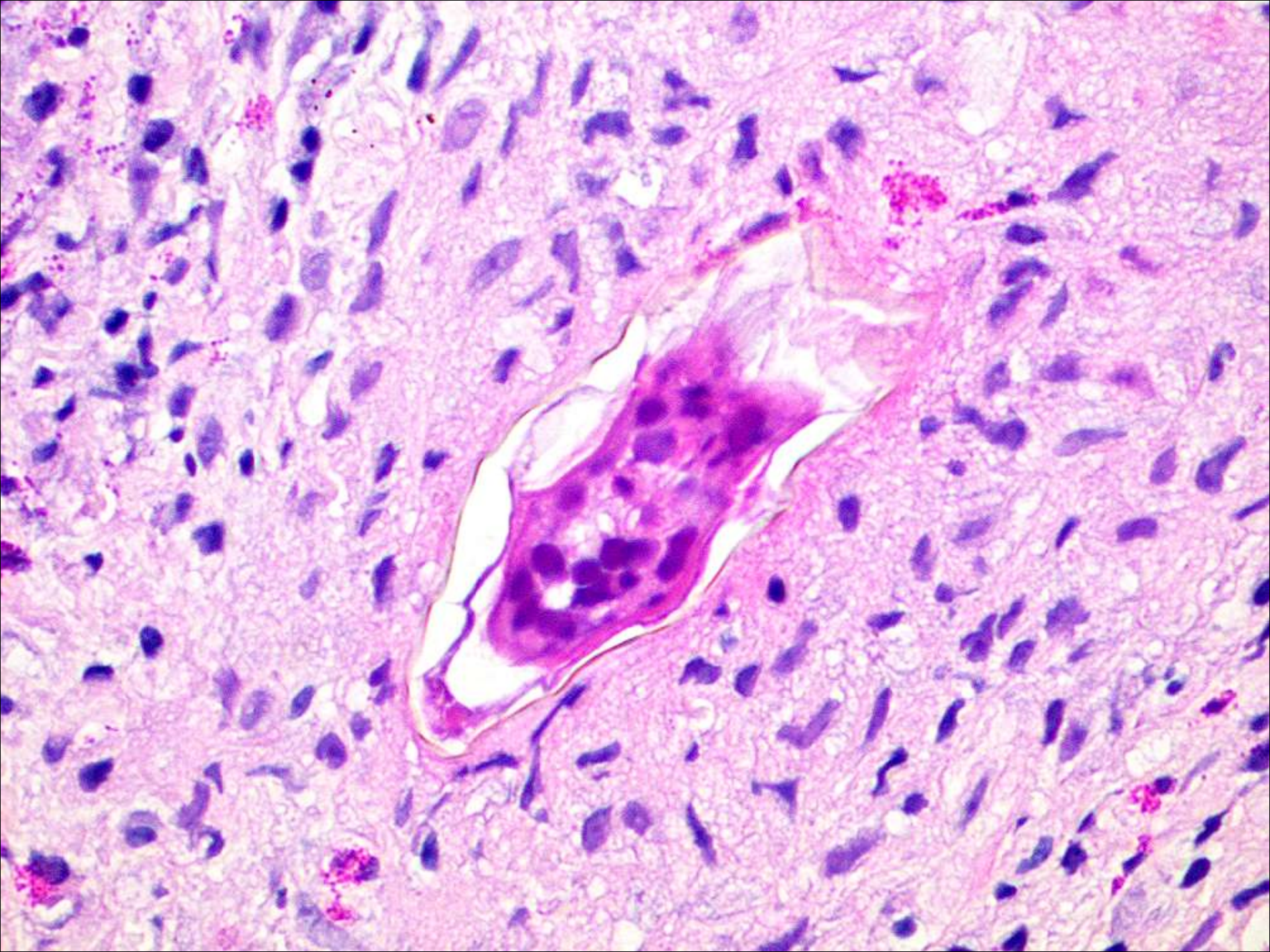
Sigmoidoscopy revealed multiple patchy areas of erythema in the rectum.

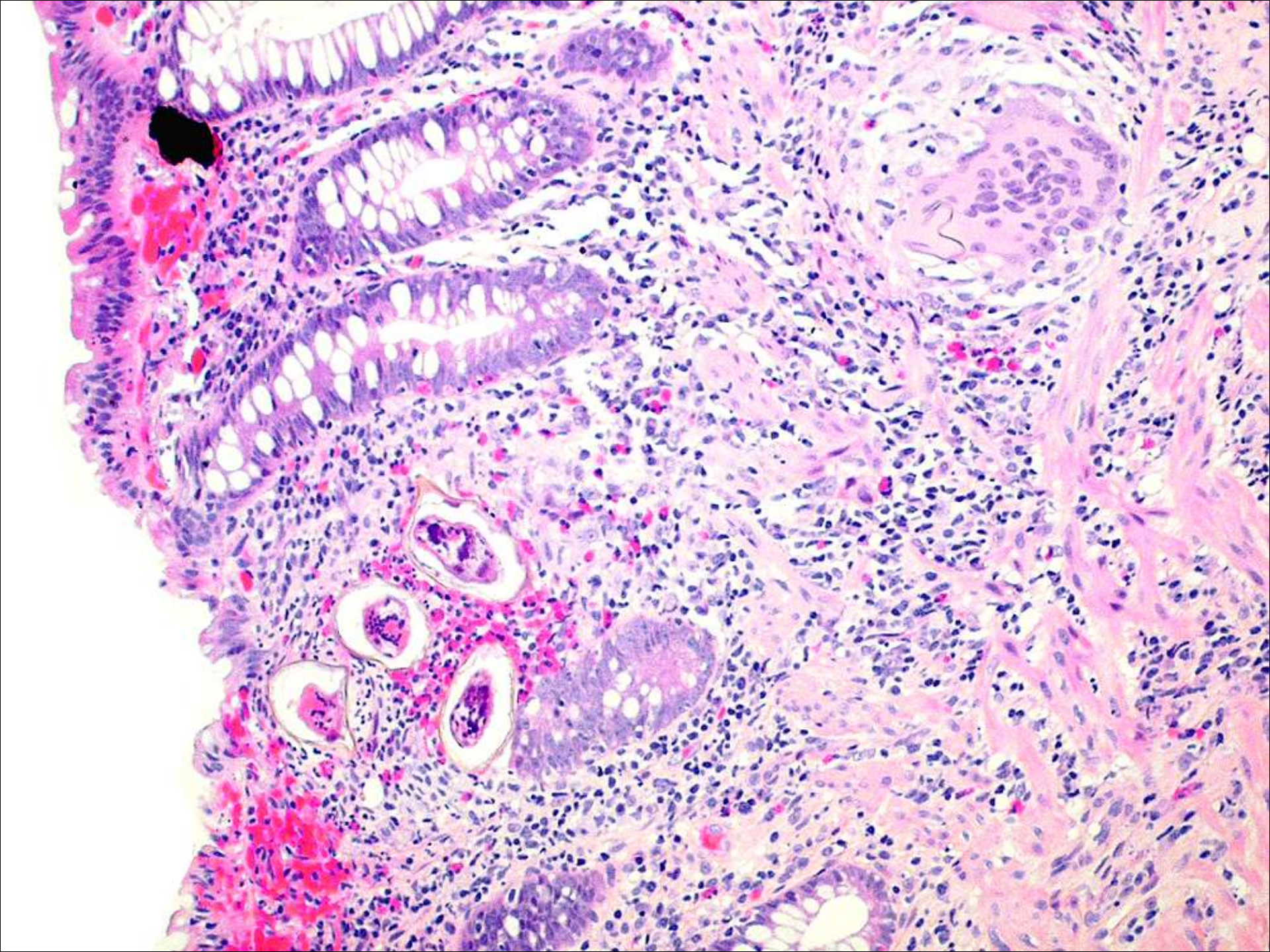
Biopsy showed multiple granulomata caused by the presence of schistosome ova.

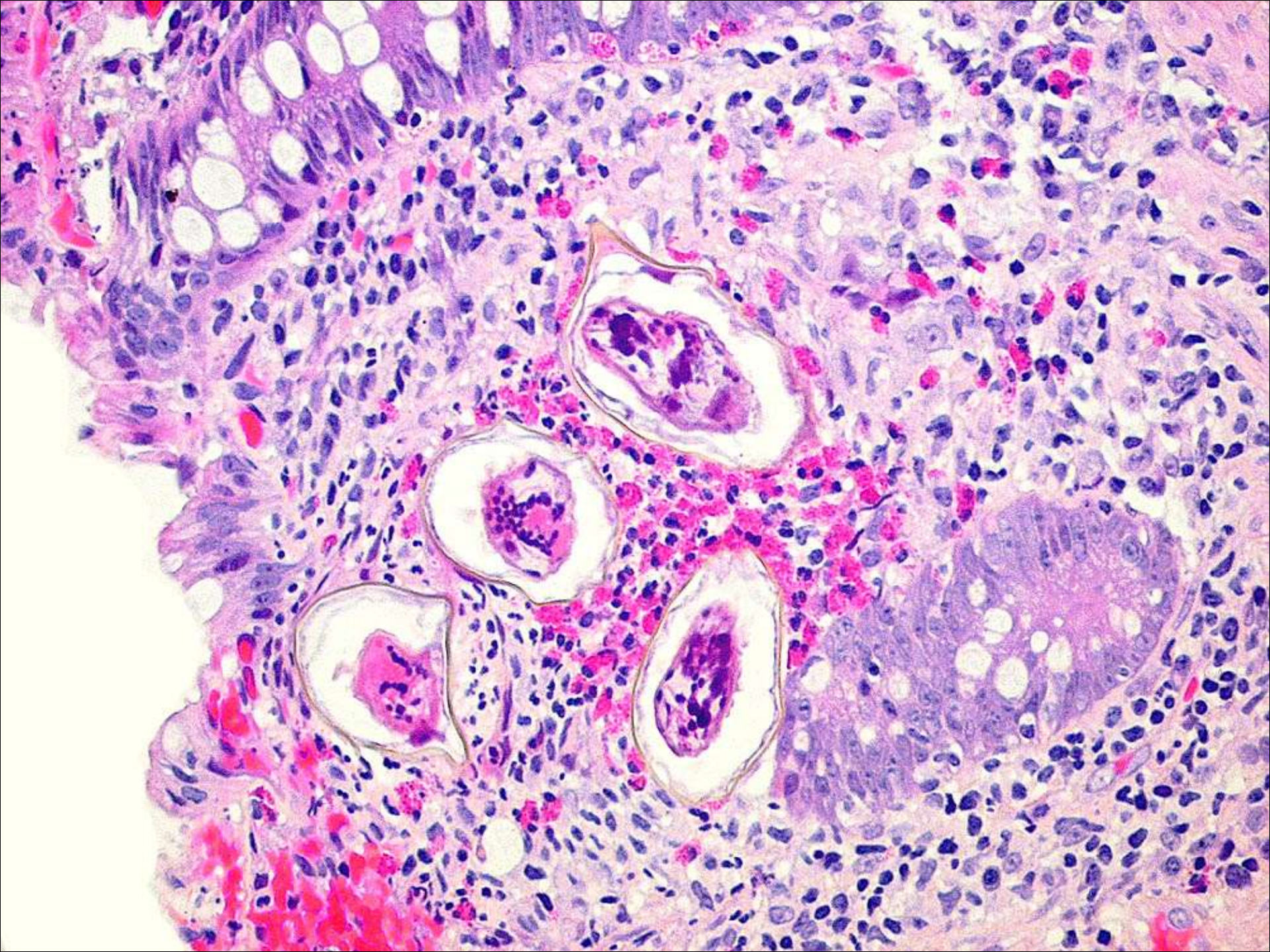


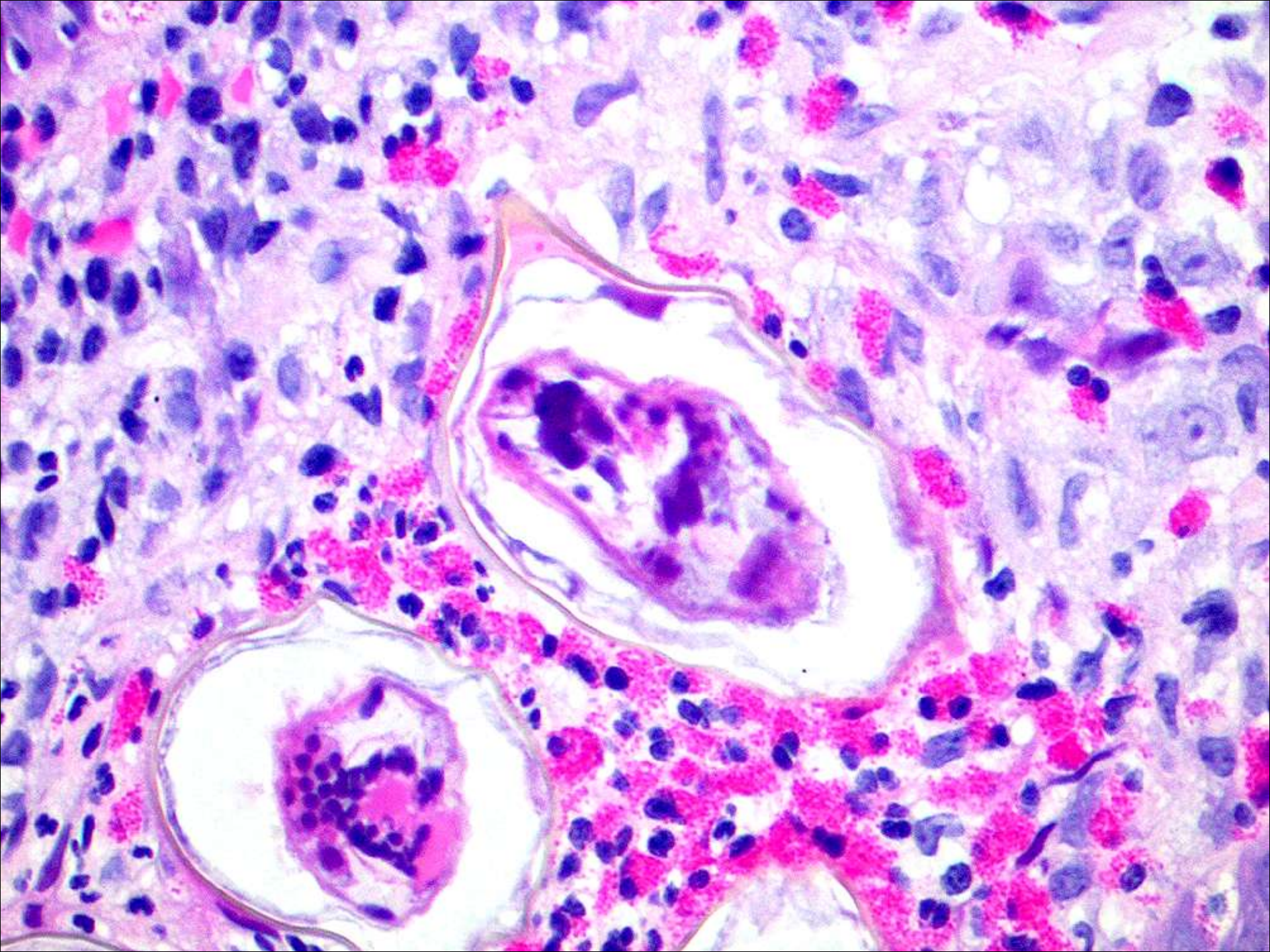


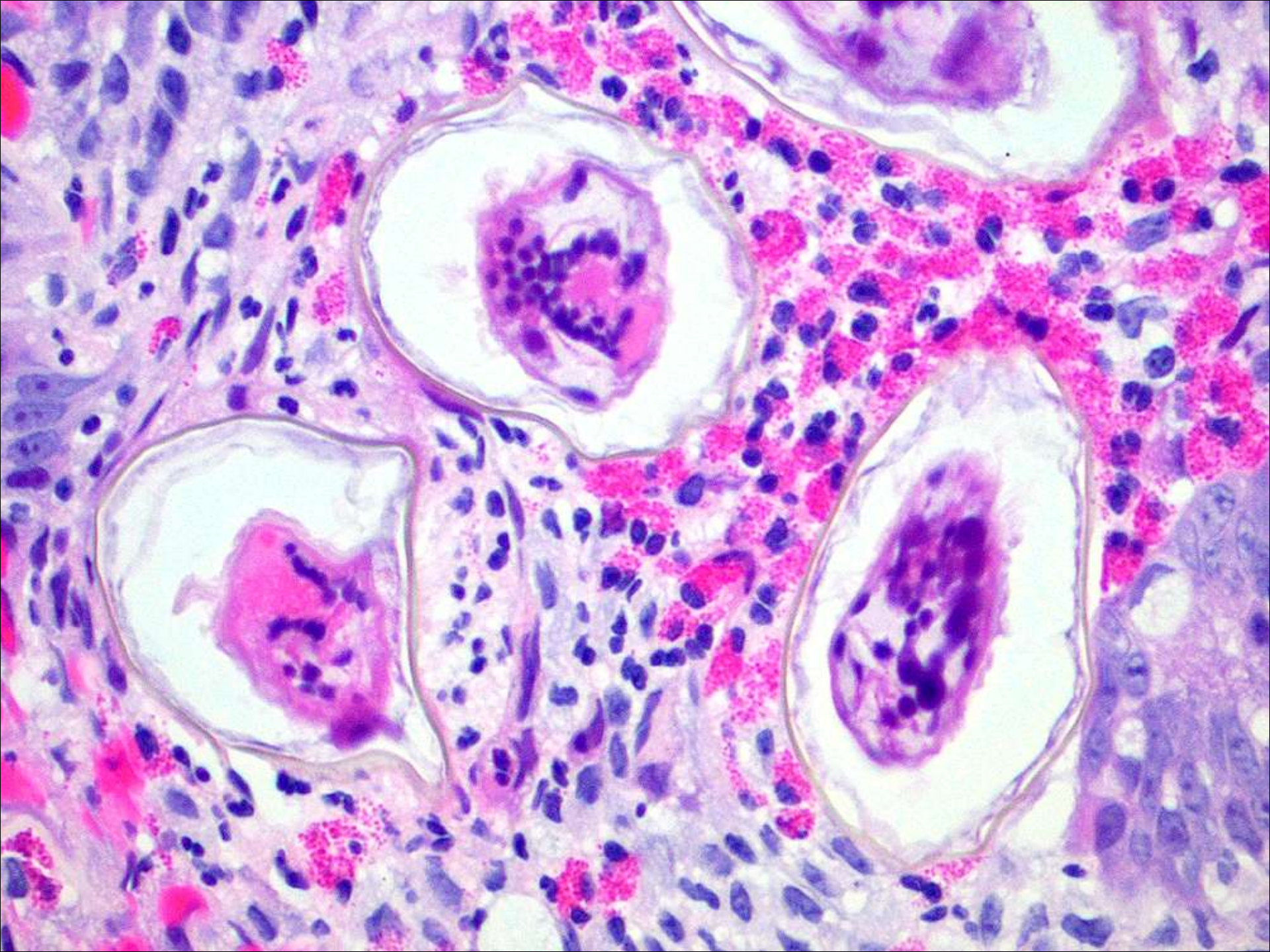


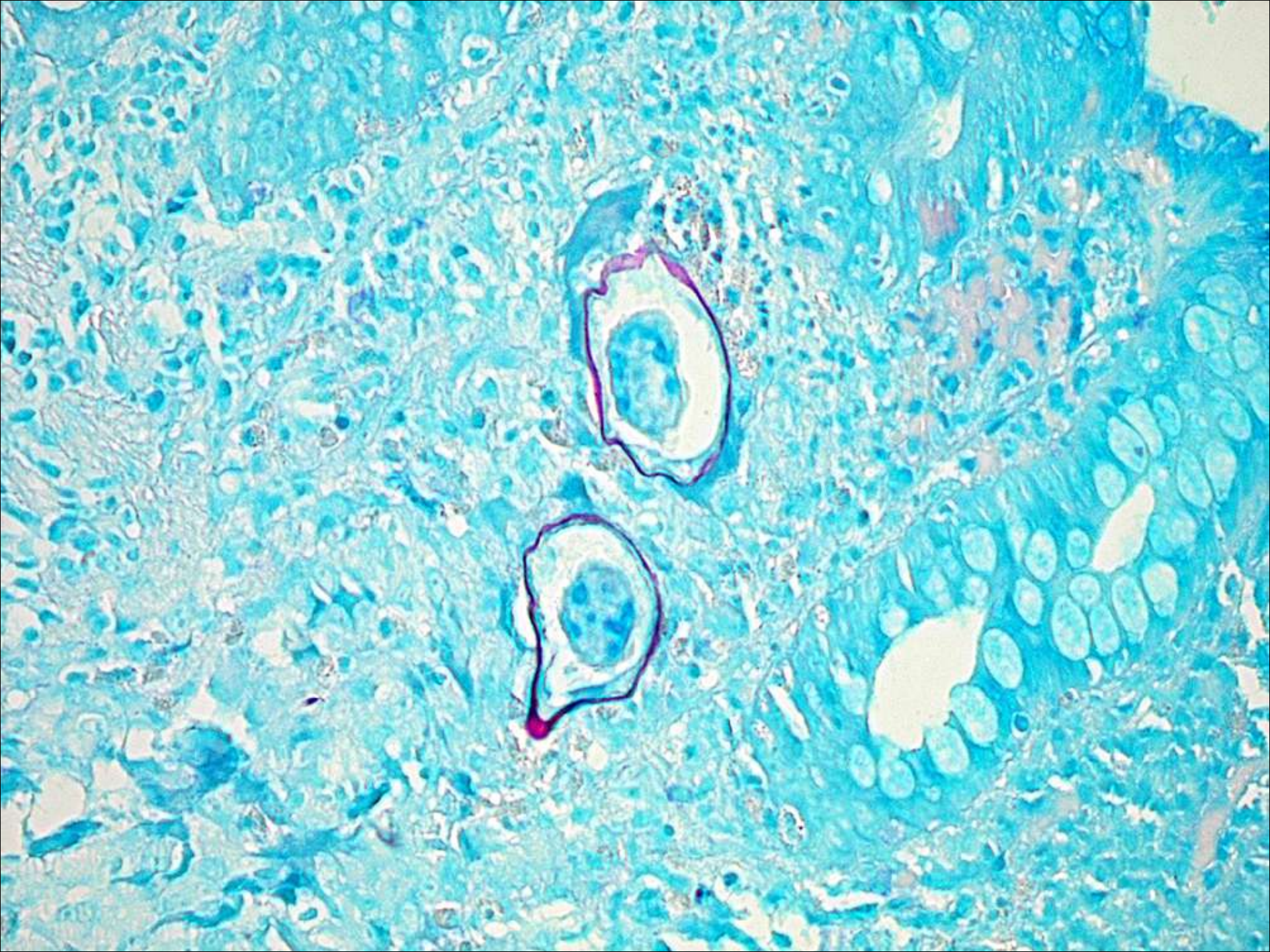


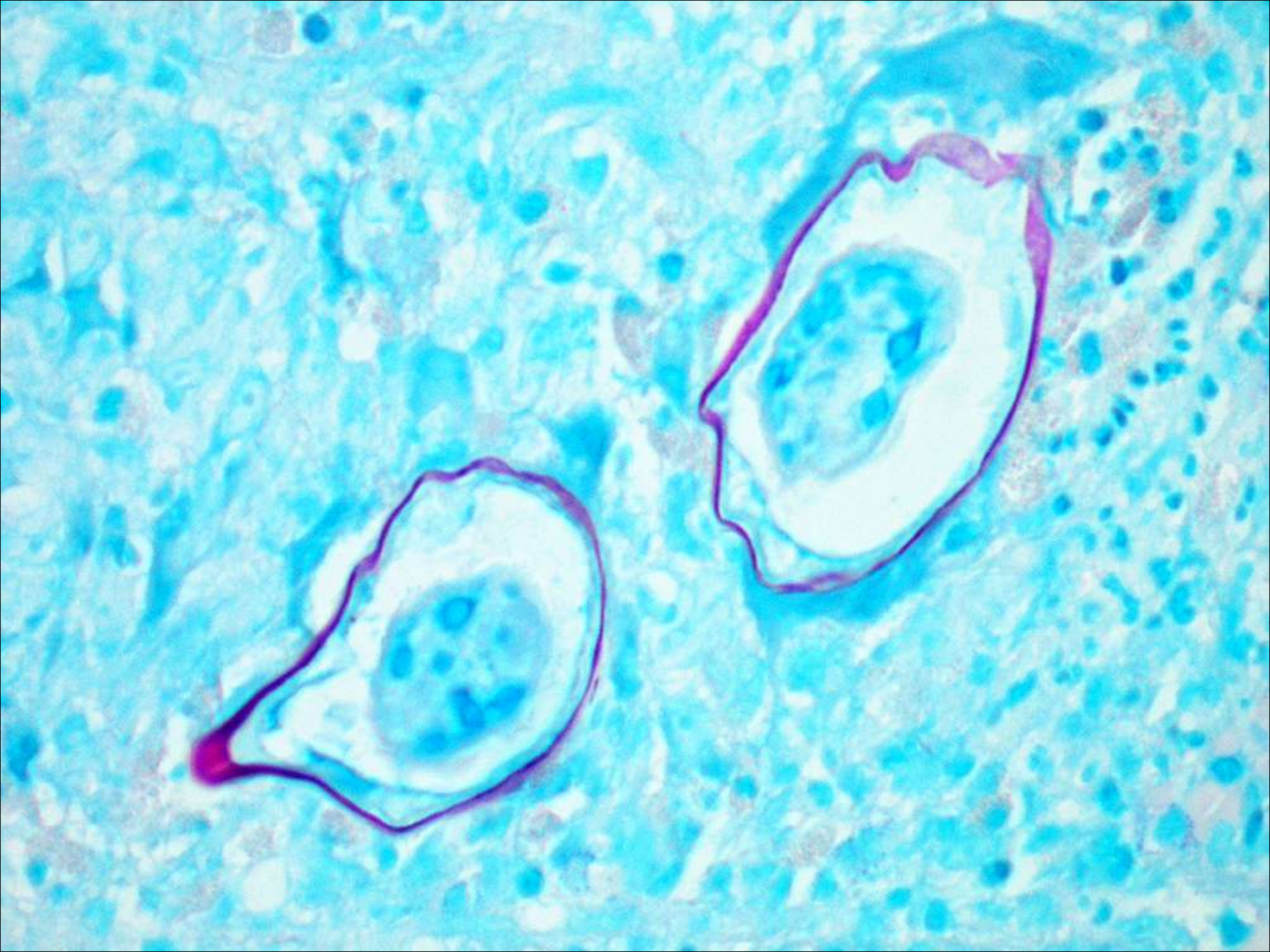












In contrast to the previous case
this is active infection with viable
eggs and an inflammatory reaction.

Case supplied by
Jan Kencian
S&N Pathology, Cairns
February 2009

A white female nurse aged 36 years presented in January 2009 with a history of 6 months PR bleeding.

Examination revealed some degree of rectal prolapse.

Sigmoidoscopy showed a patchy redness of the mucosa and a 4 cm pedunculated polyp which was excised.

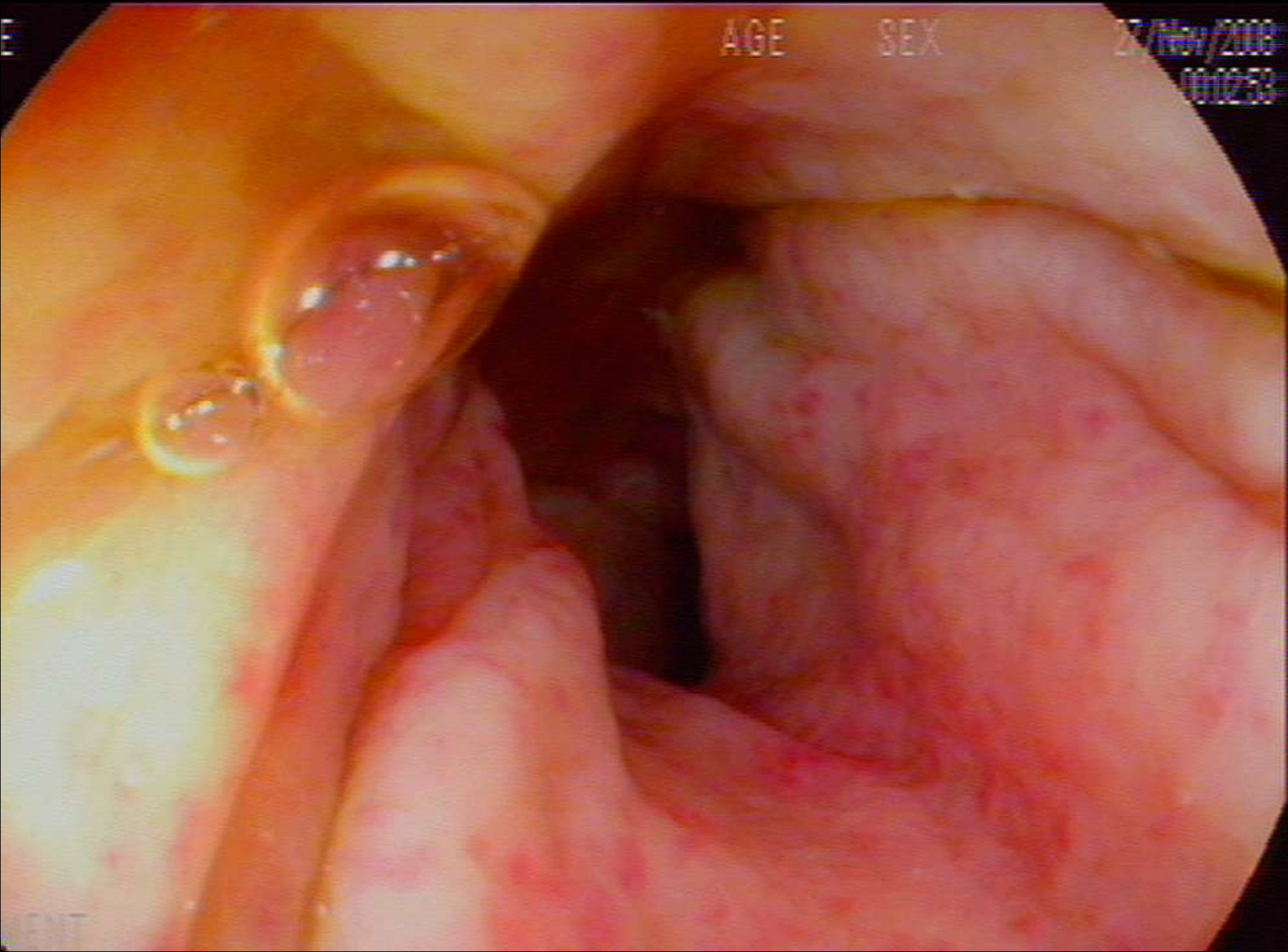
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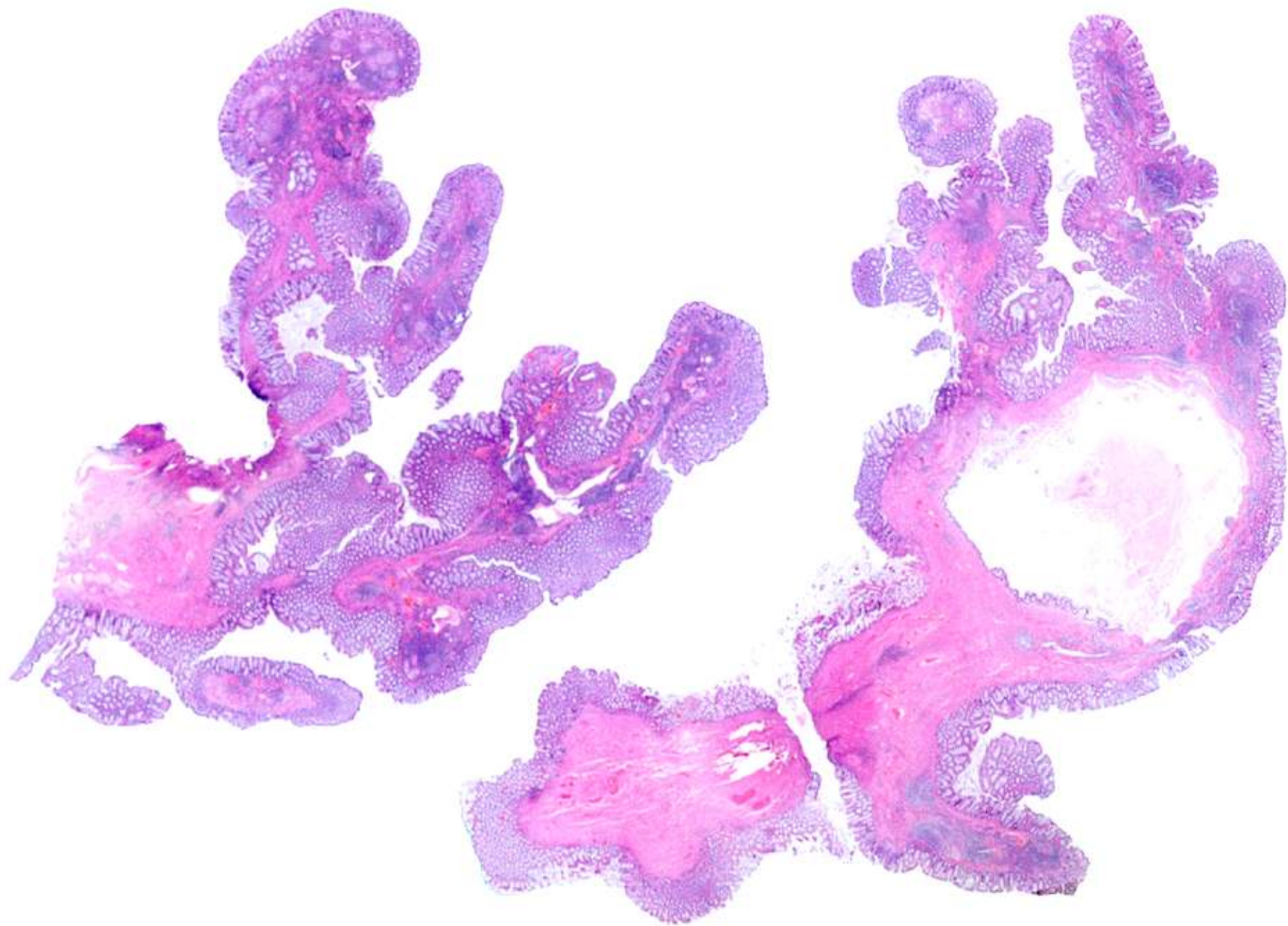
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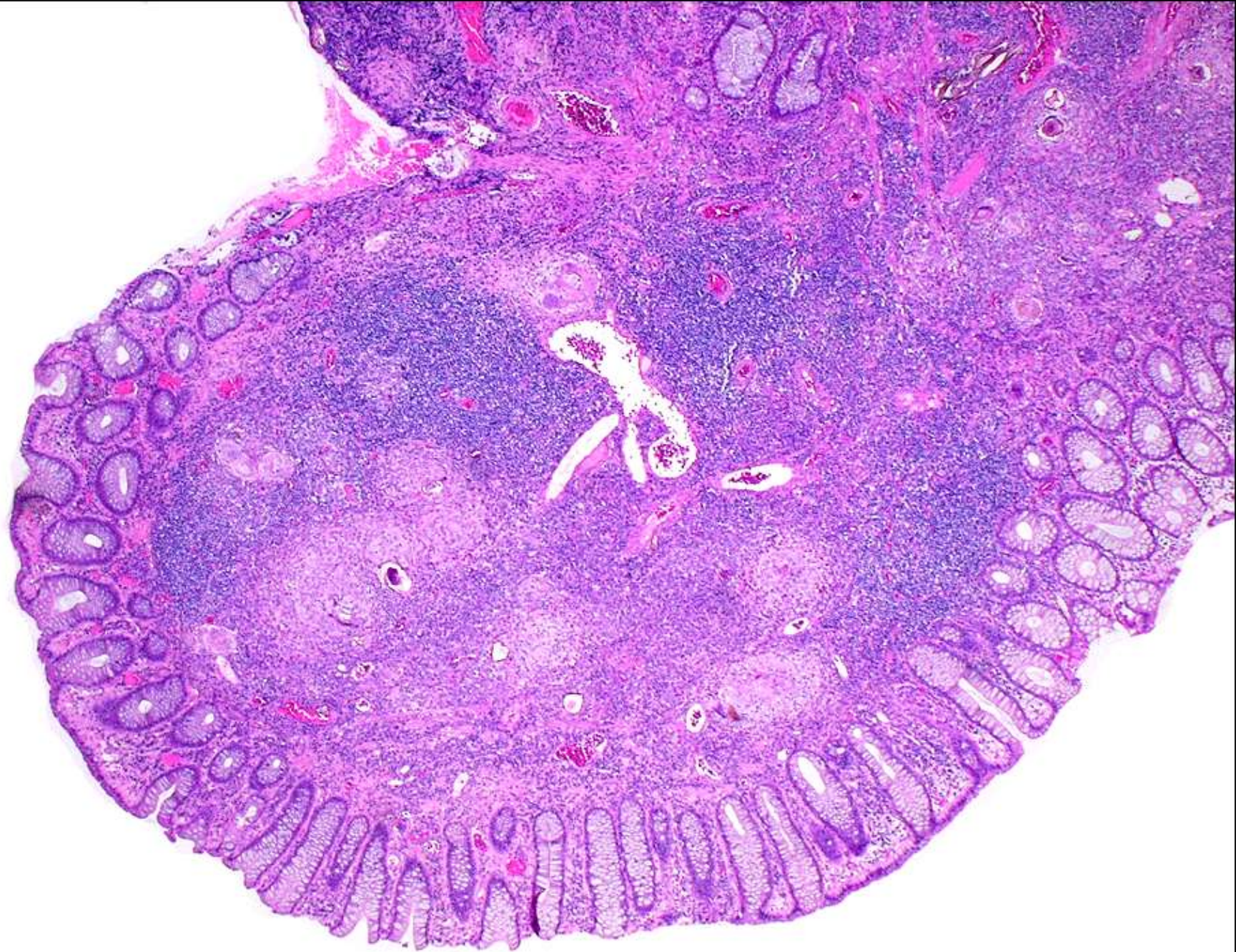
27/Nov/2008

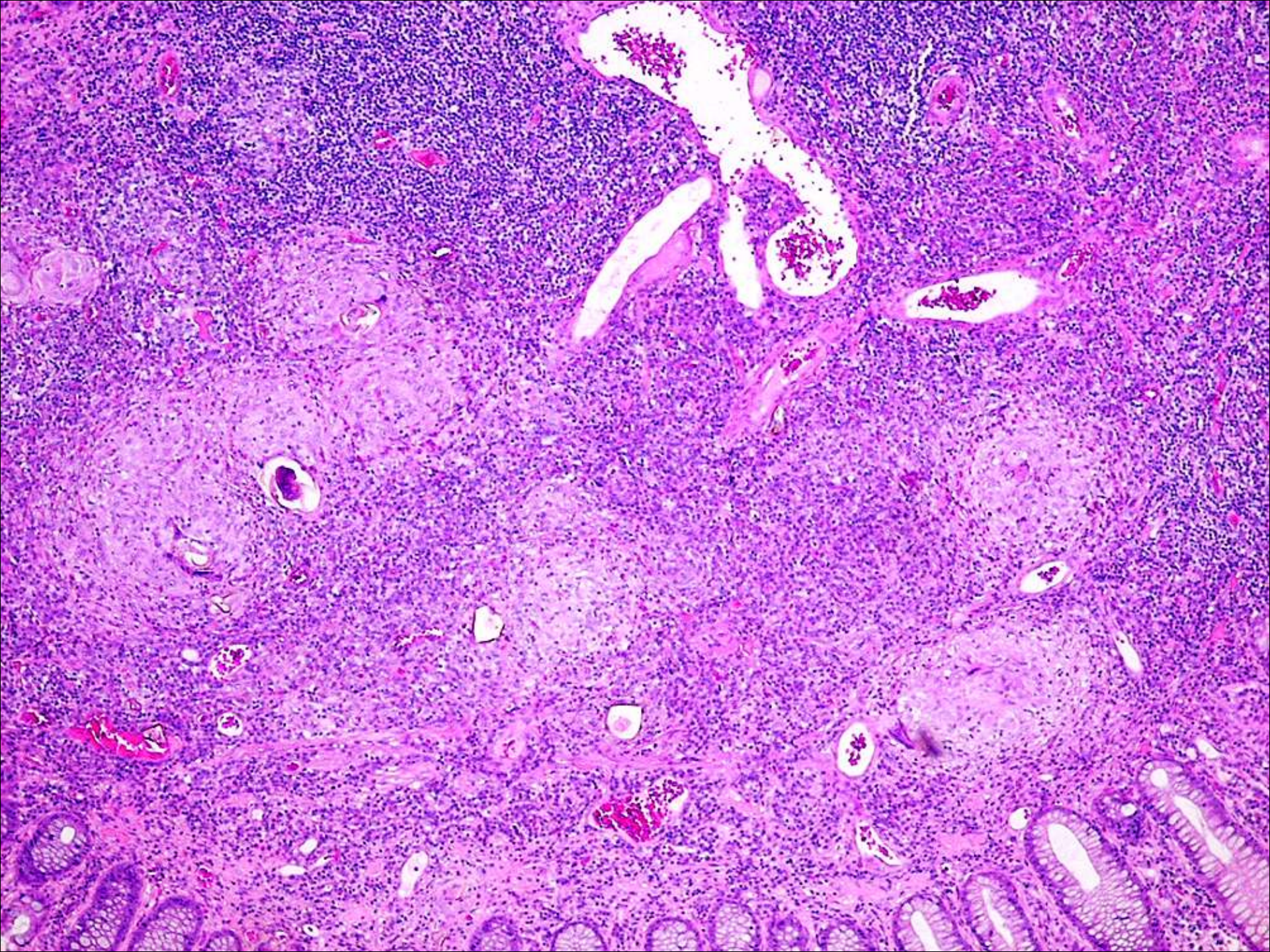
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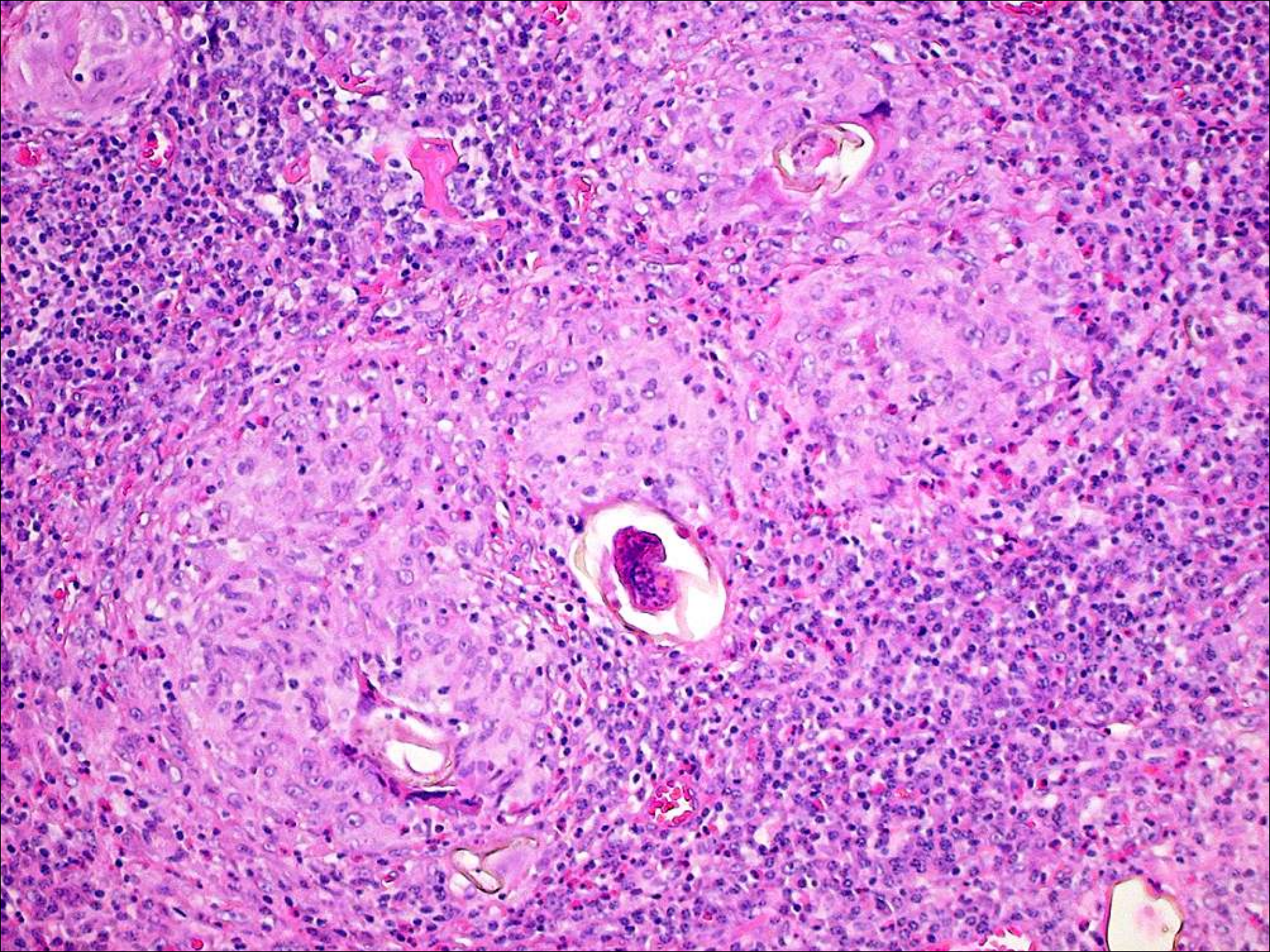


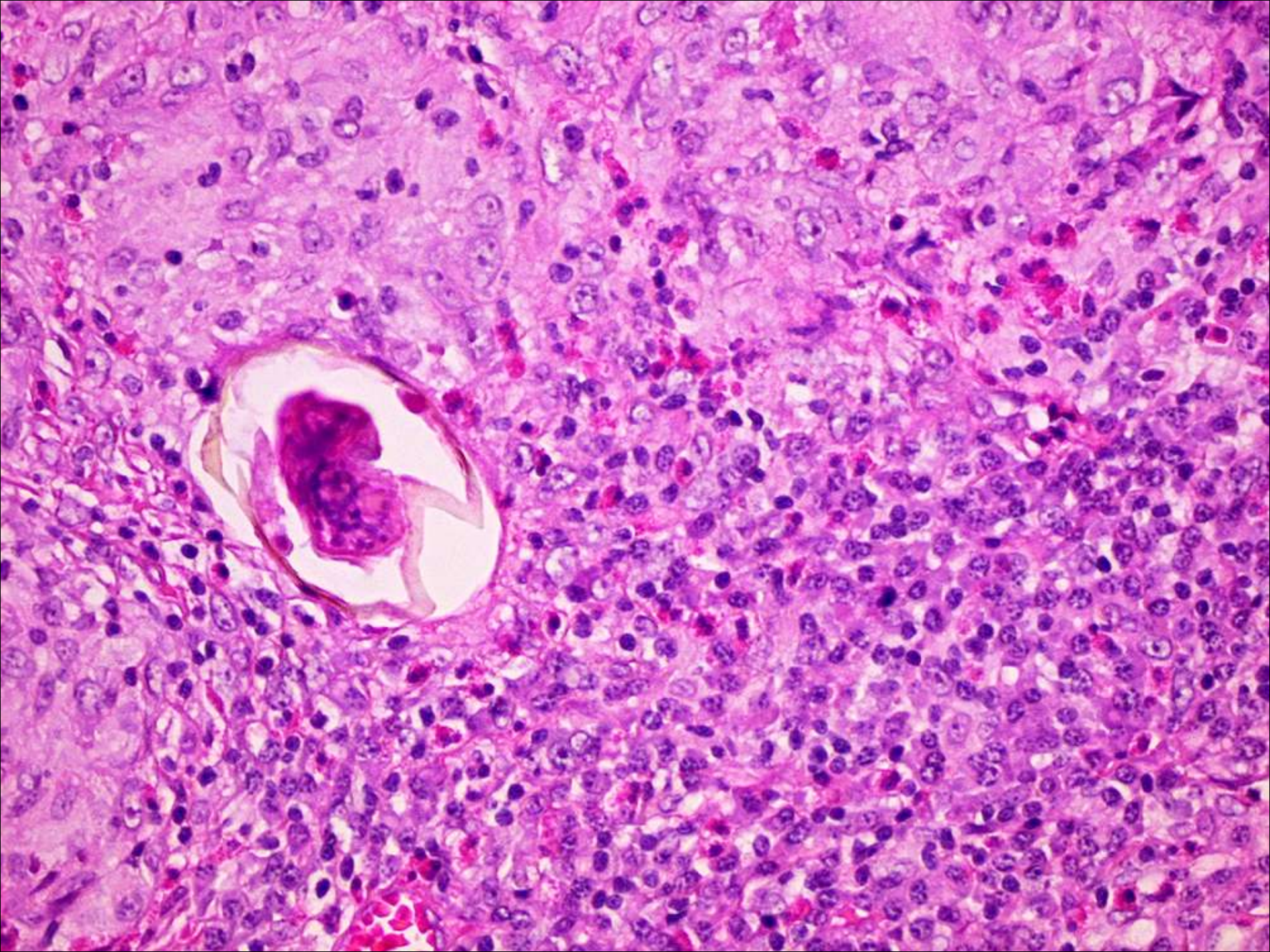
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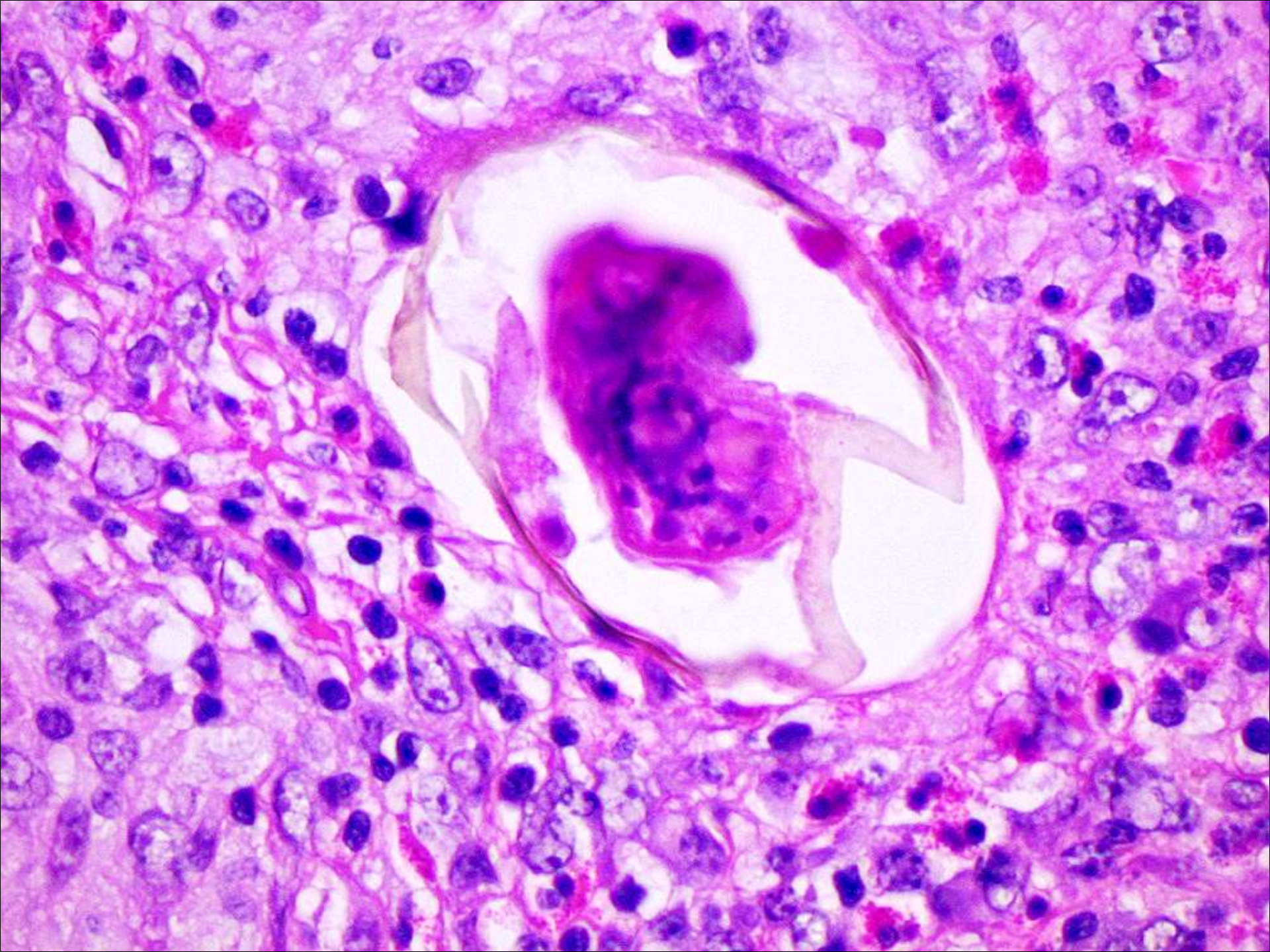


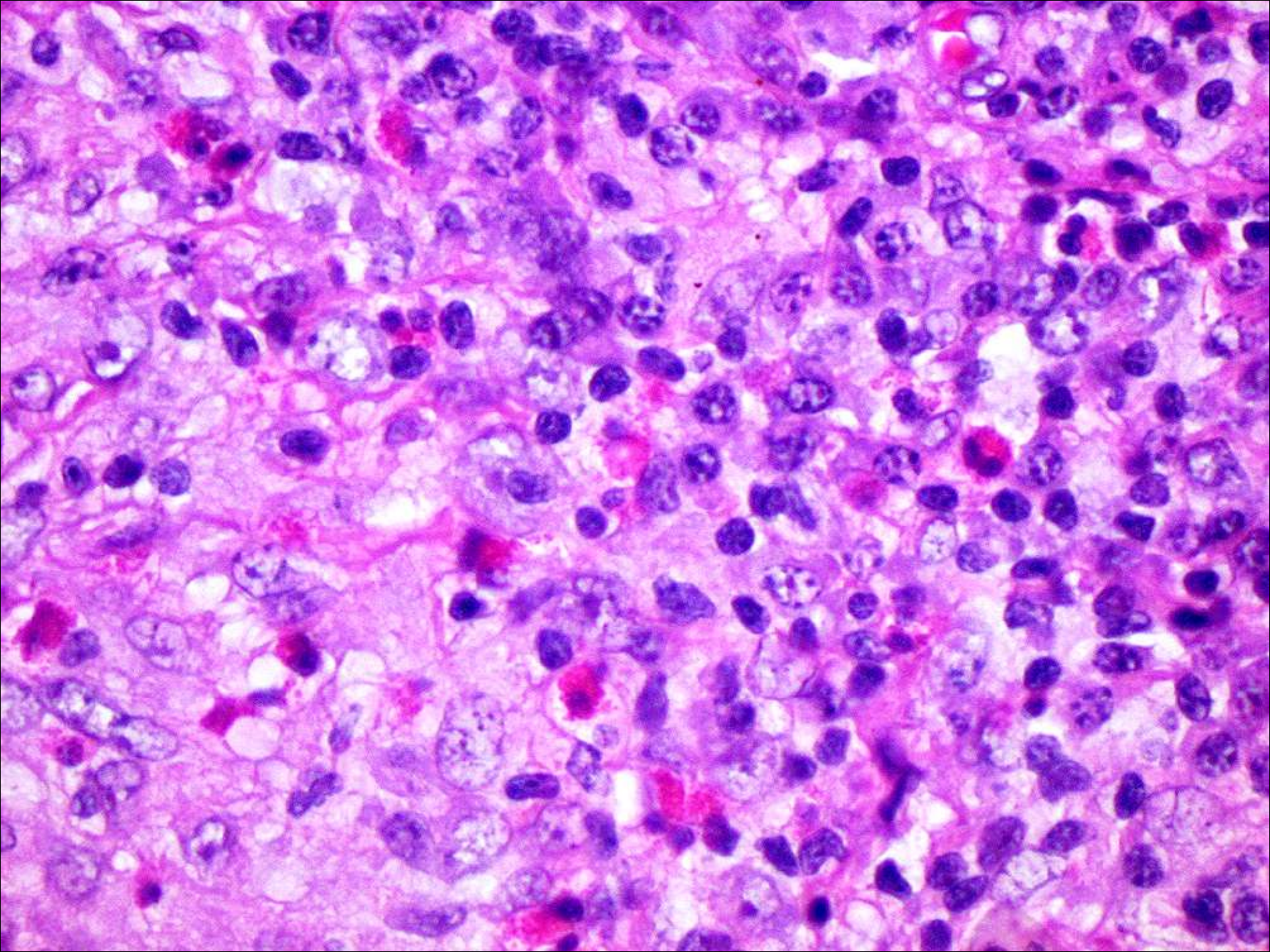


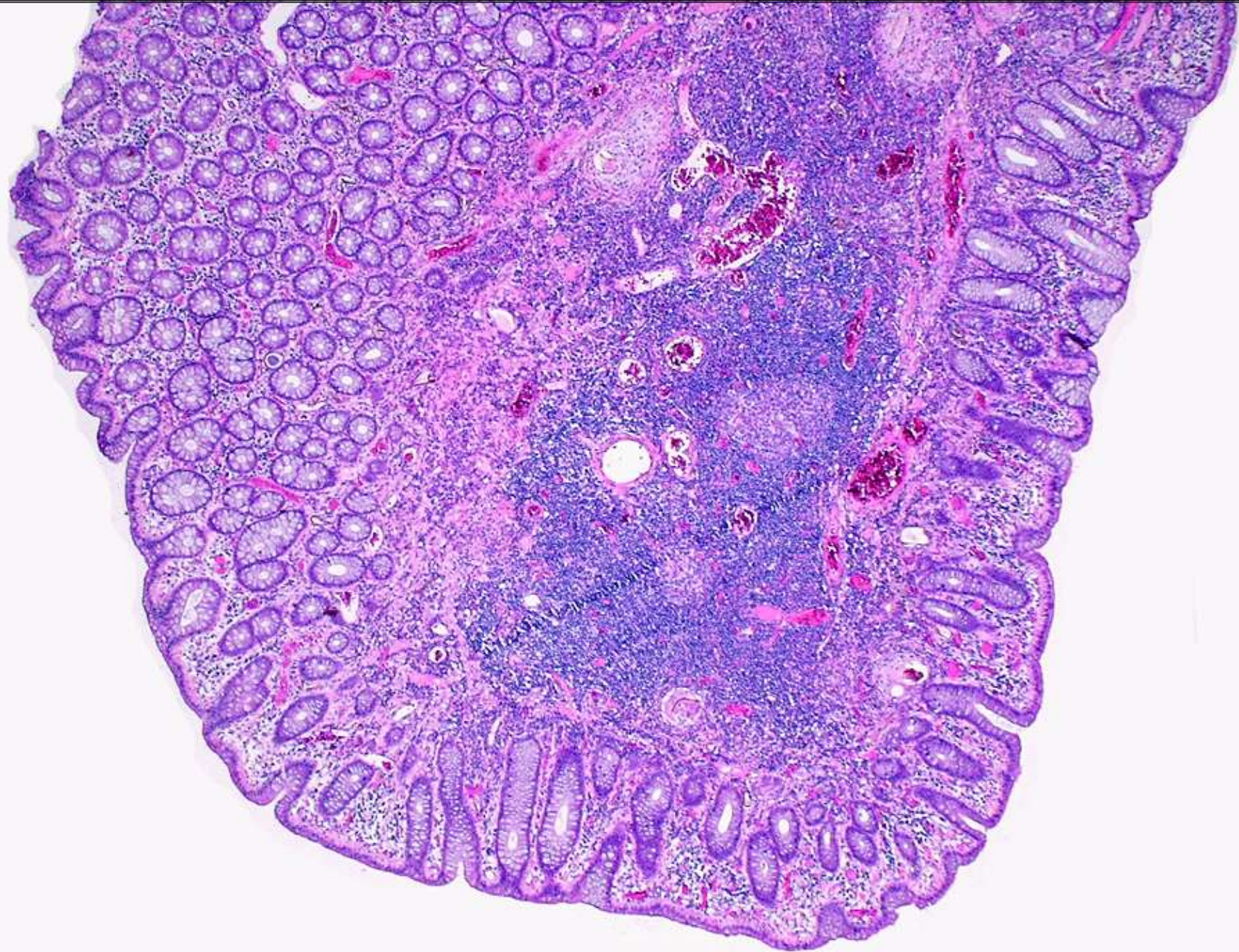


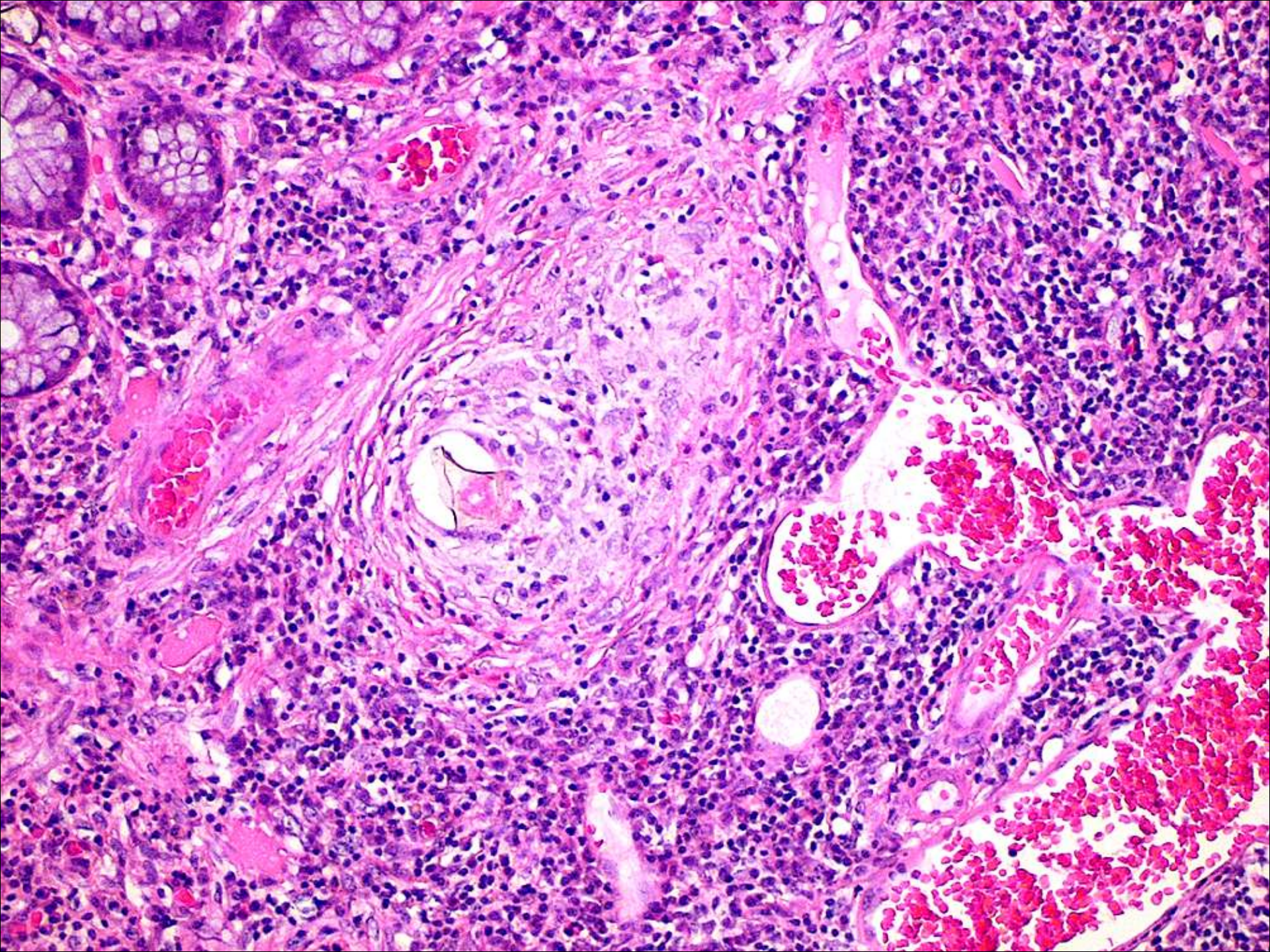


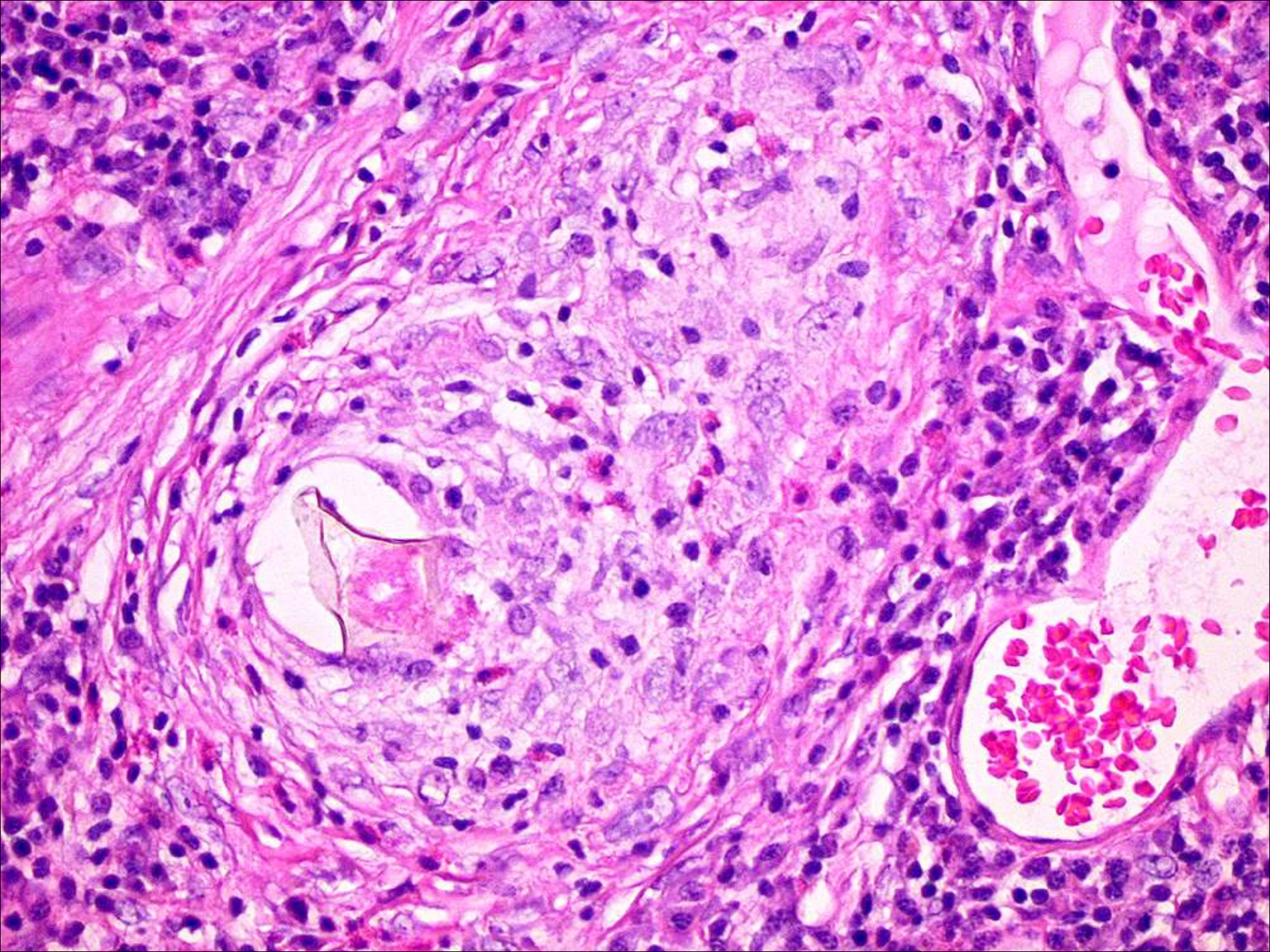


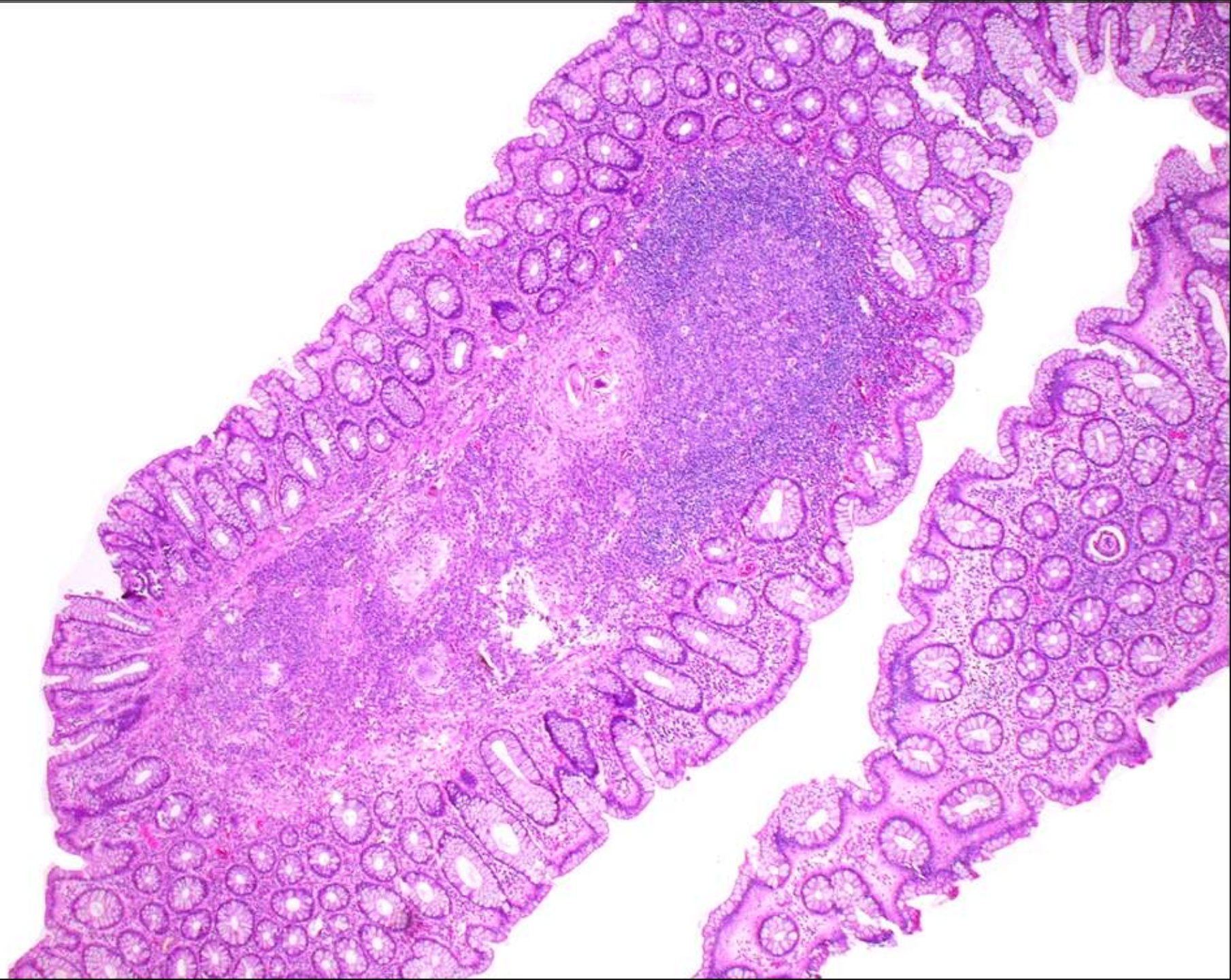


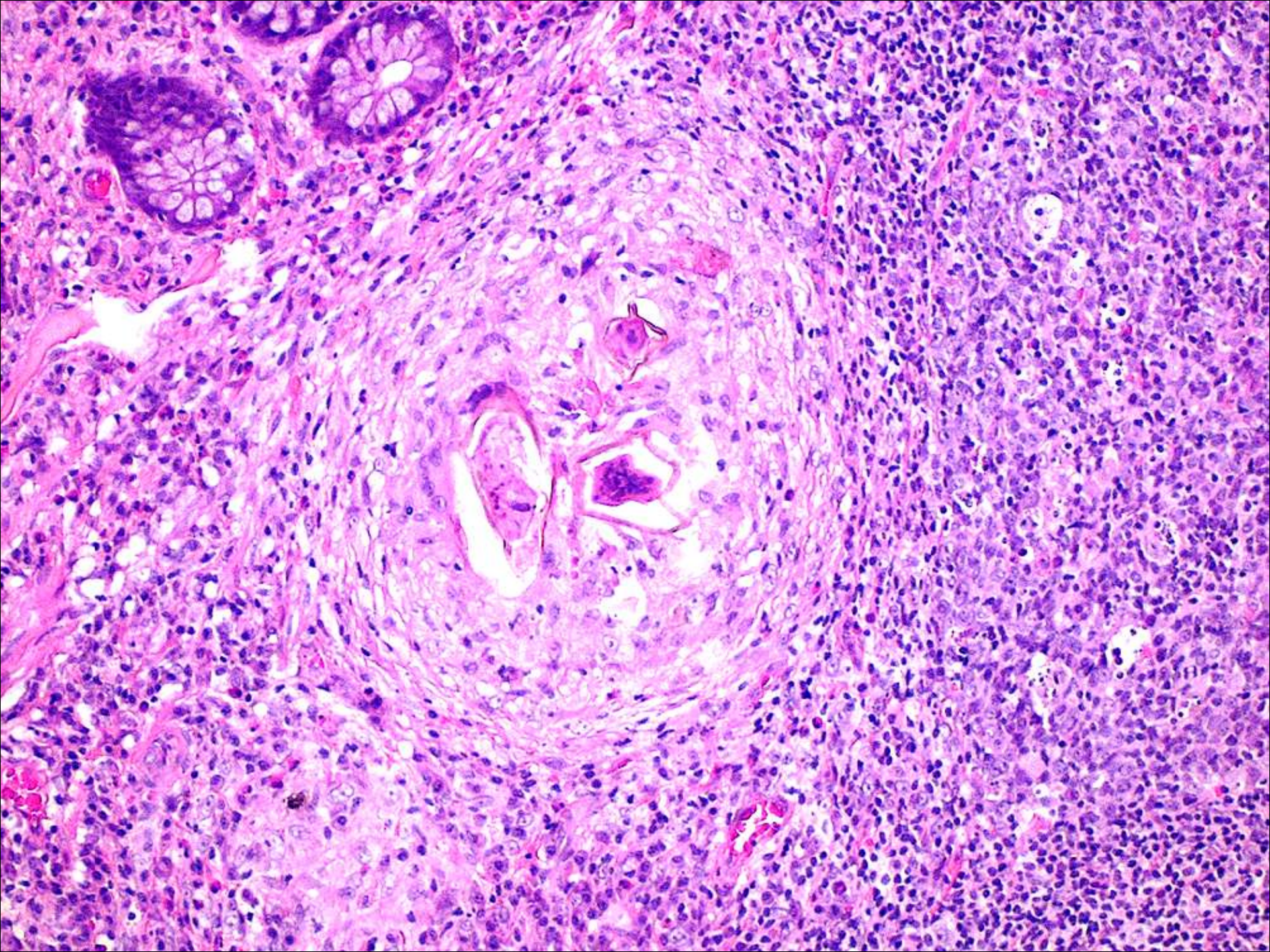


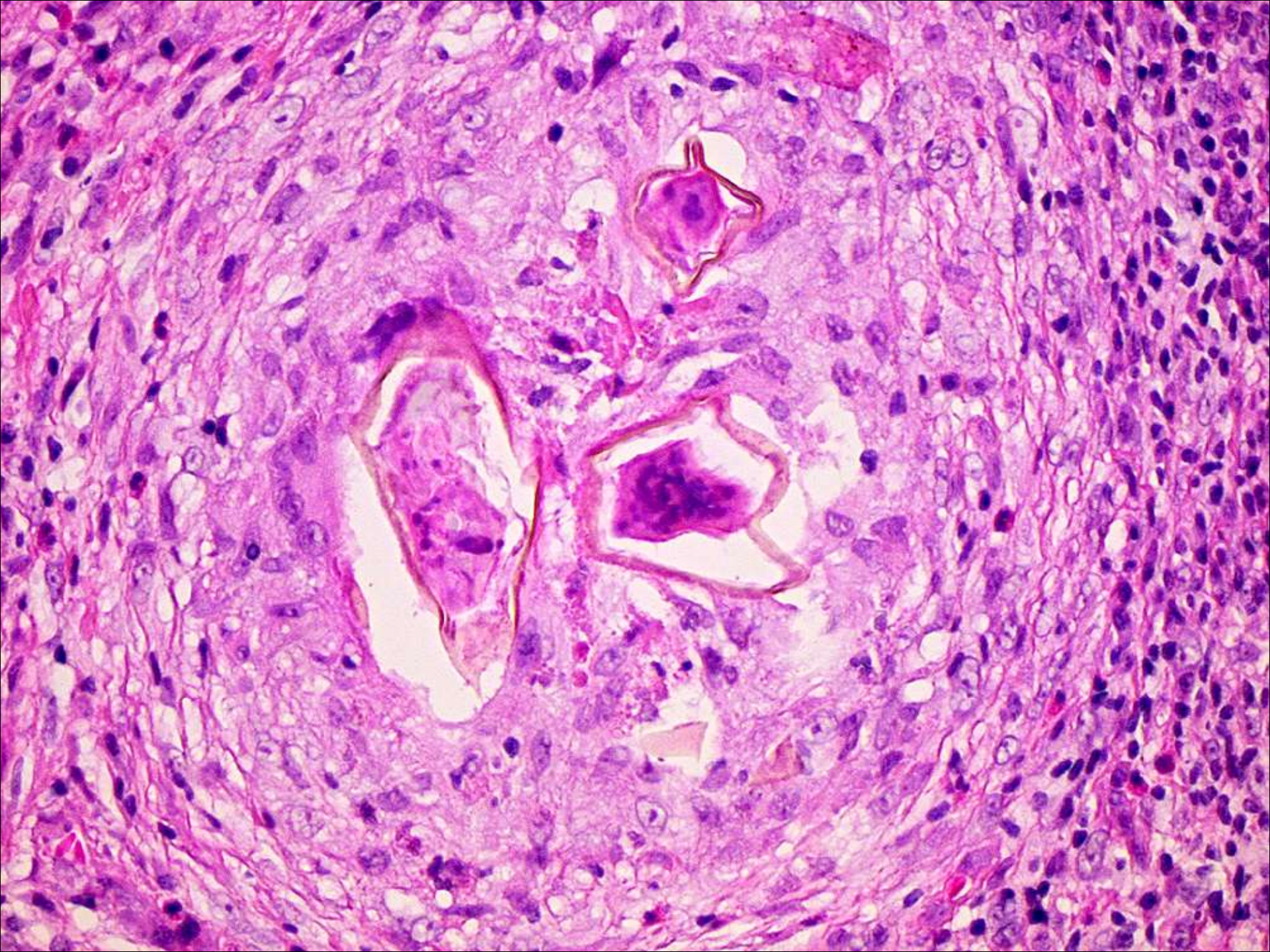


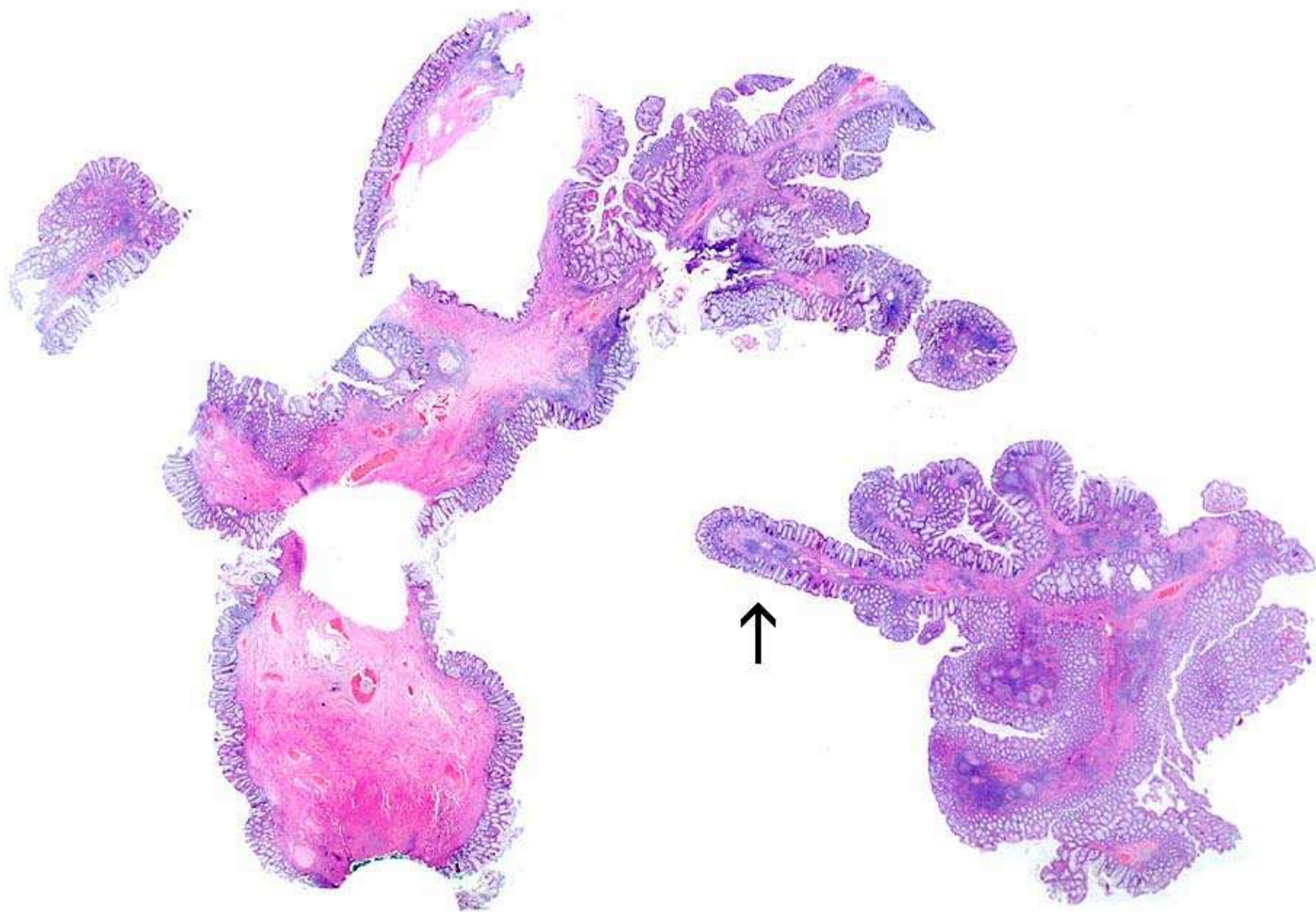


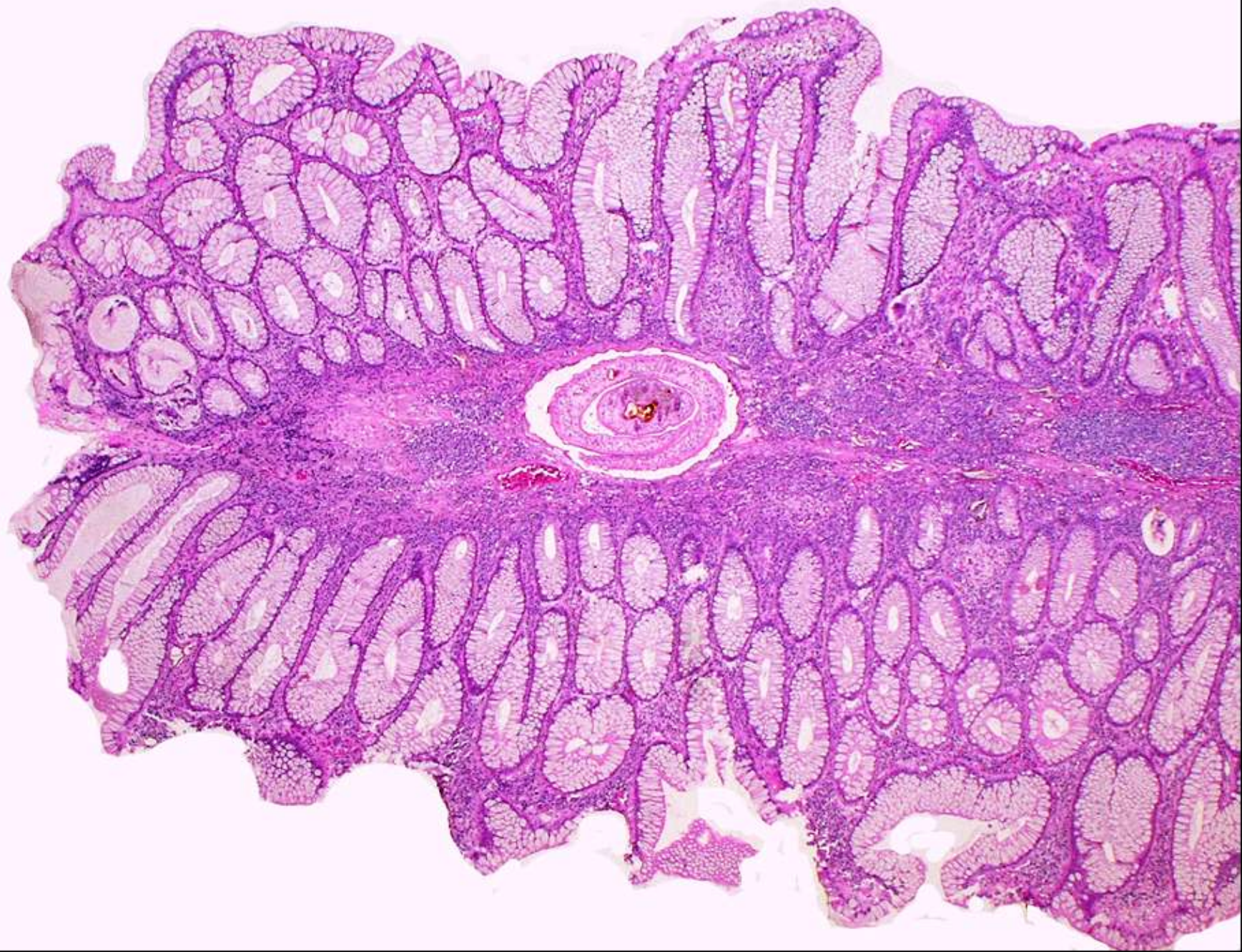


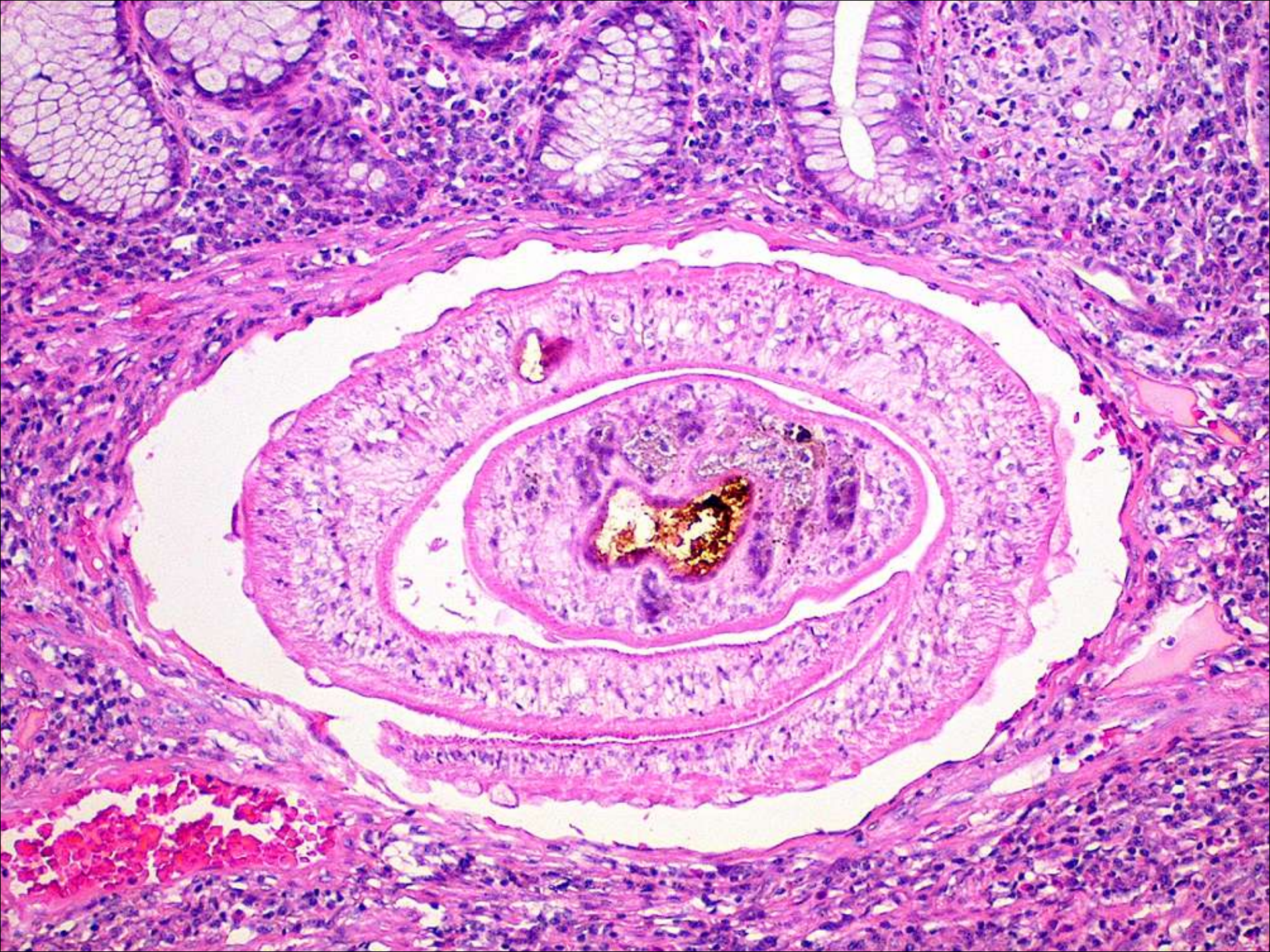


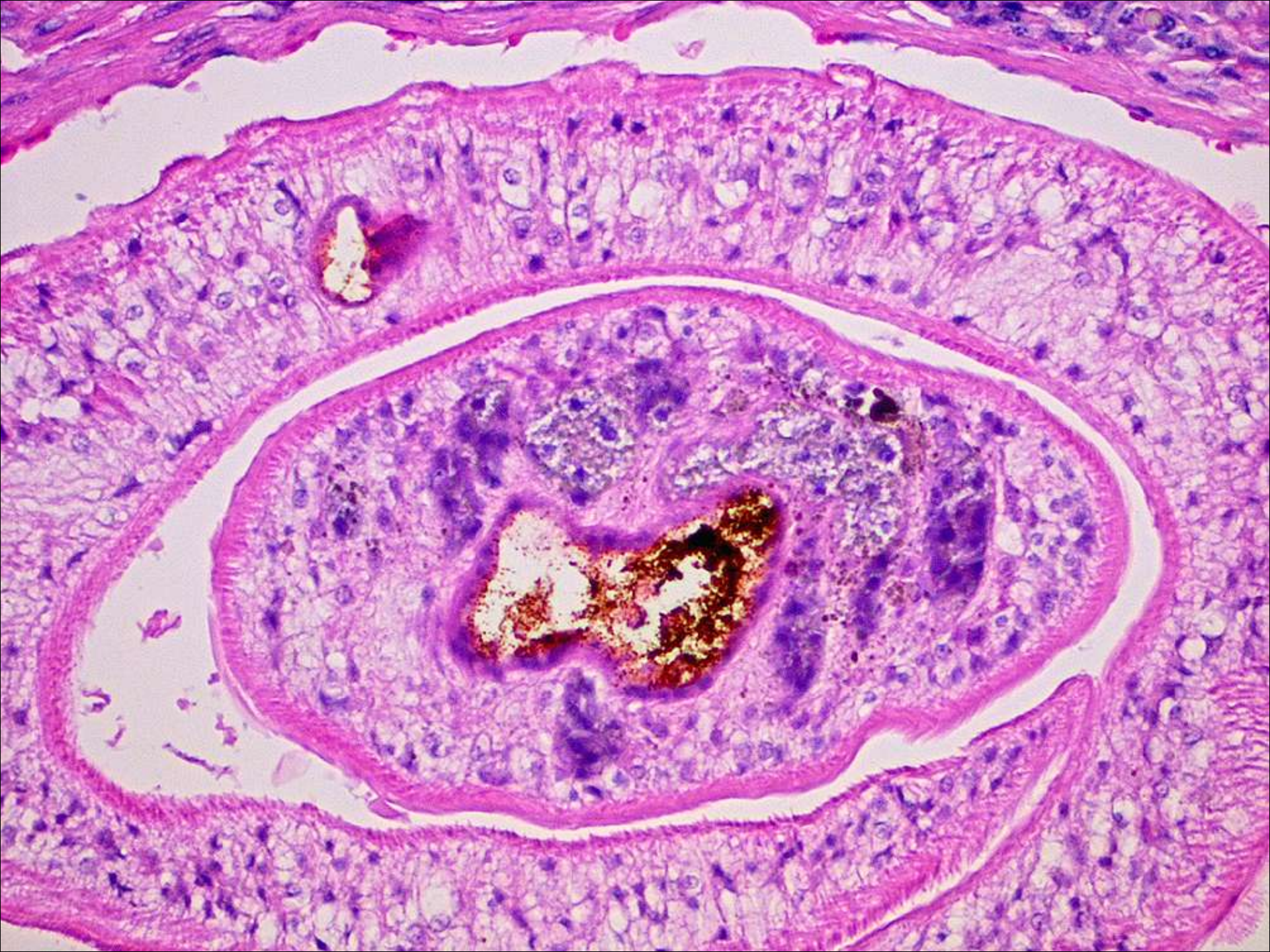


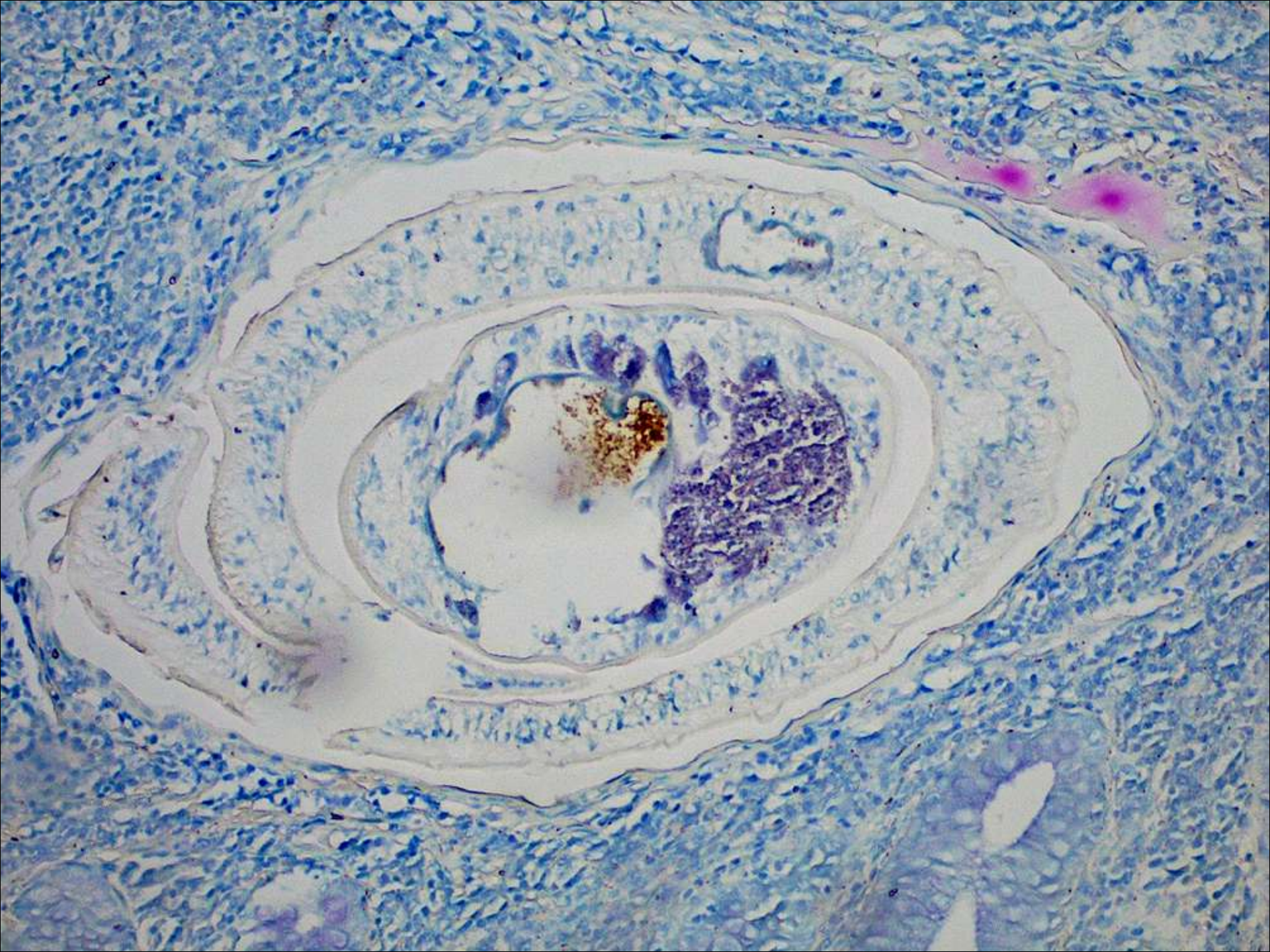


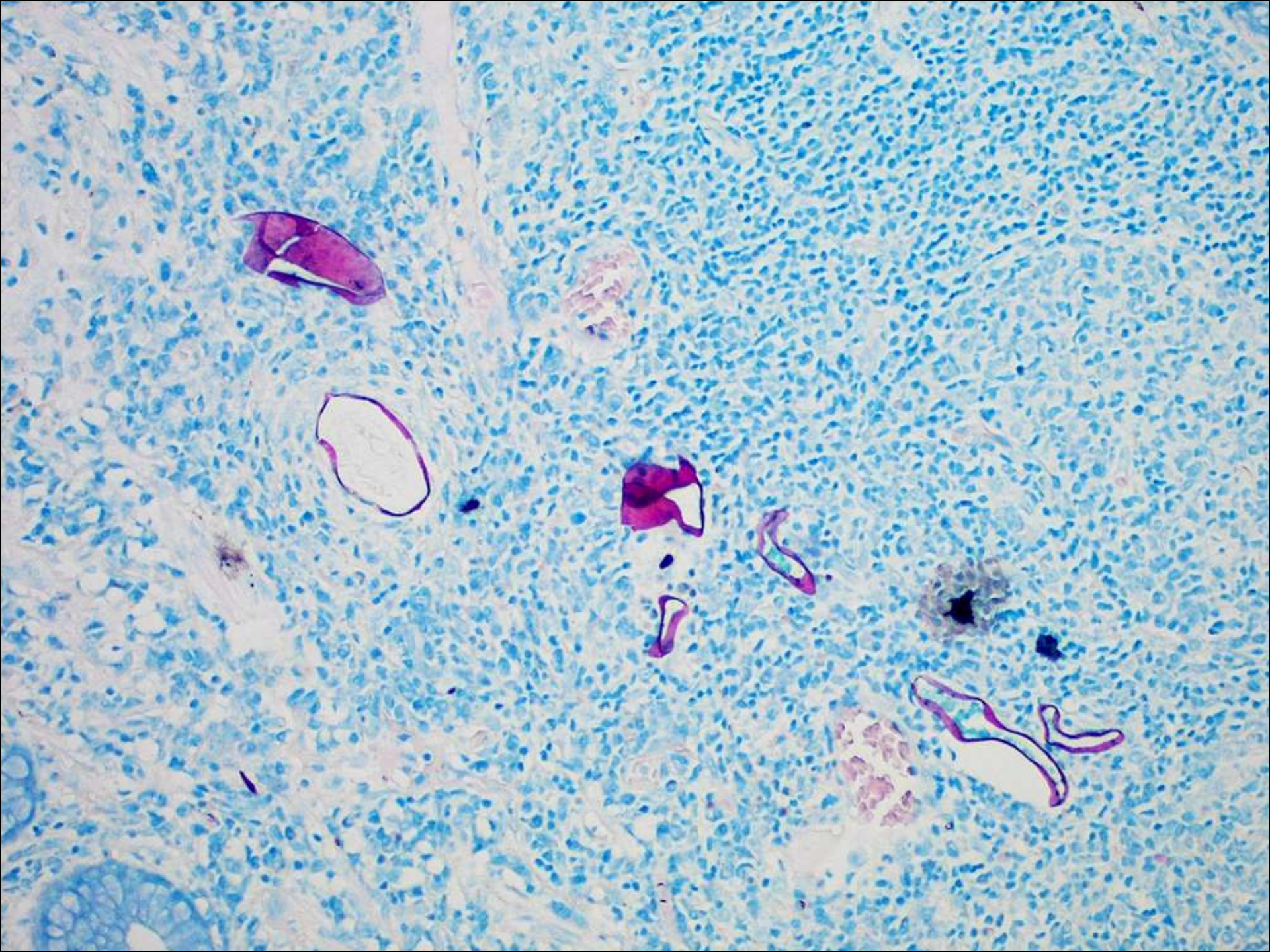












Histology revealed the presence of granulomas associated with the presence of schistosome ova.

Diagnosis Schistosomal proctitis.

She was treated with Praziquantel 40 mg/kg in 2 doses per day.

The bleeding stopped and follow up sigmoidoscopy was normal.

Further history:

The patient had emigrated from South Africa with her husband 3 years ago.

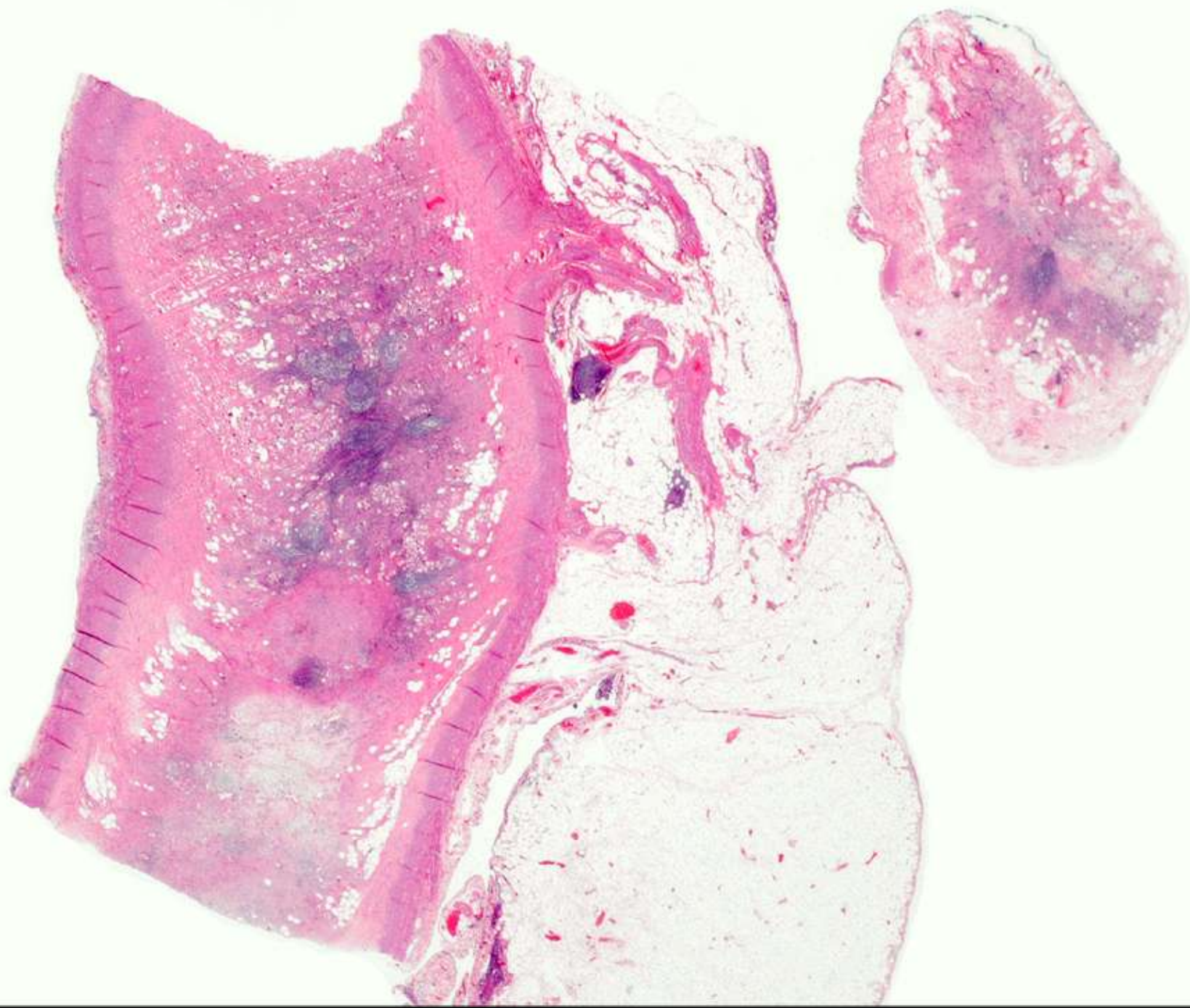
She has type 2 diabetes which is controlled by diet.

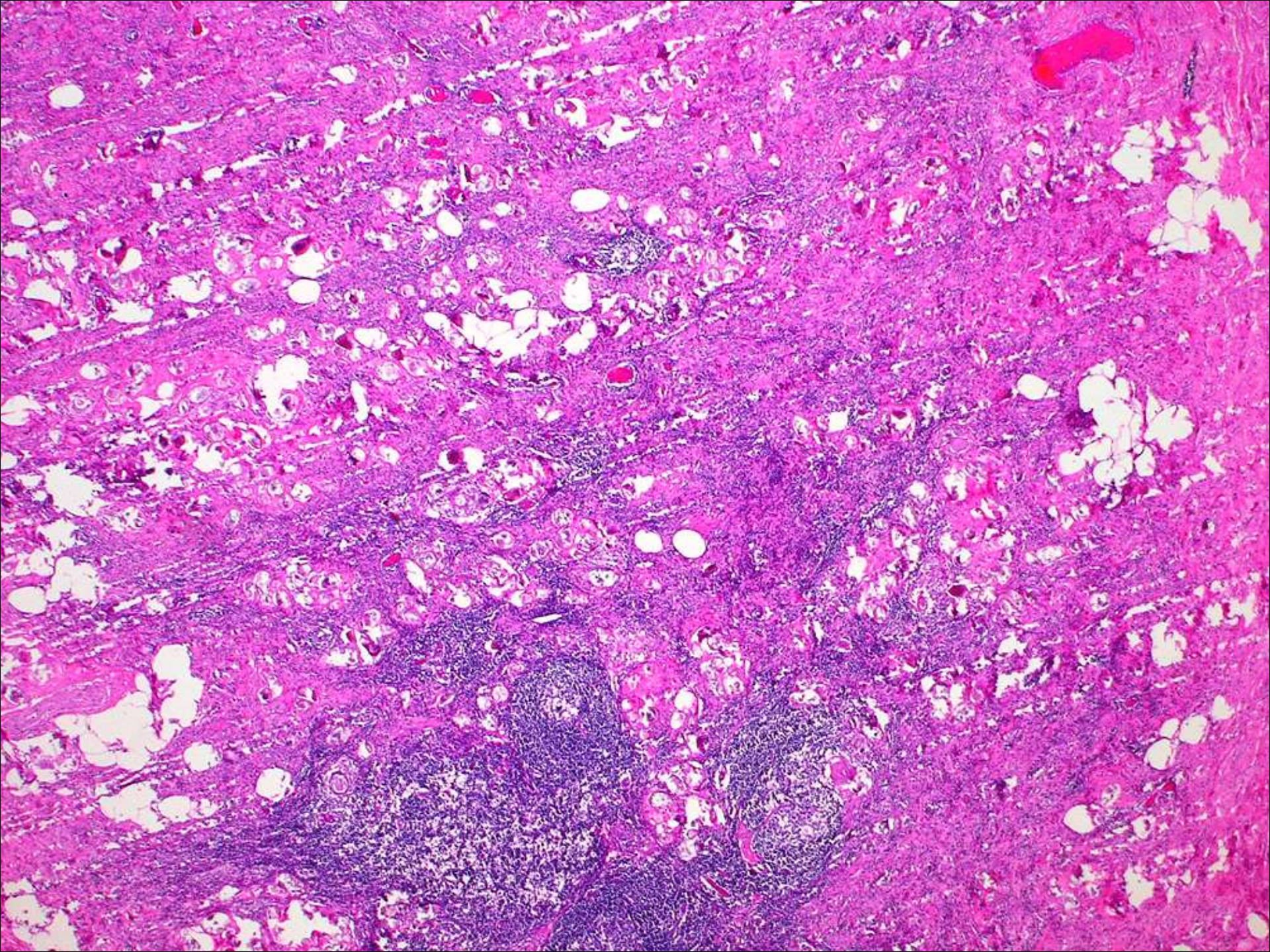
Schistosomiasis appendix

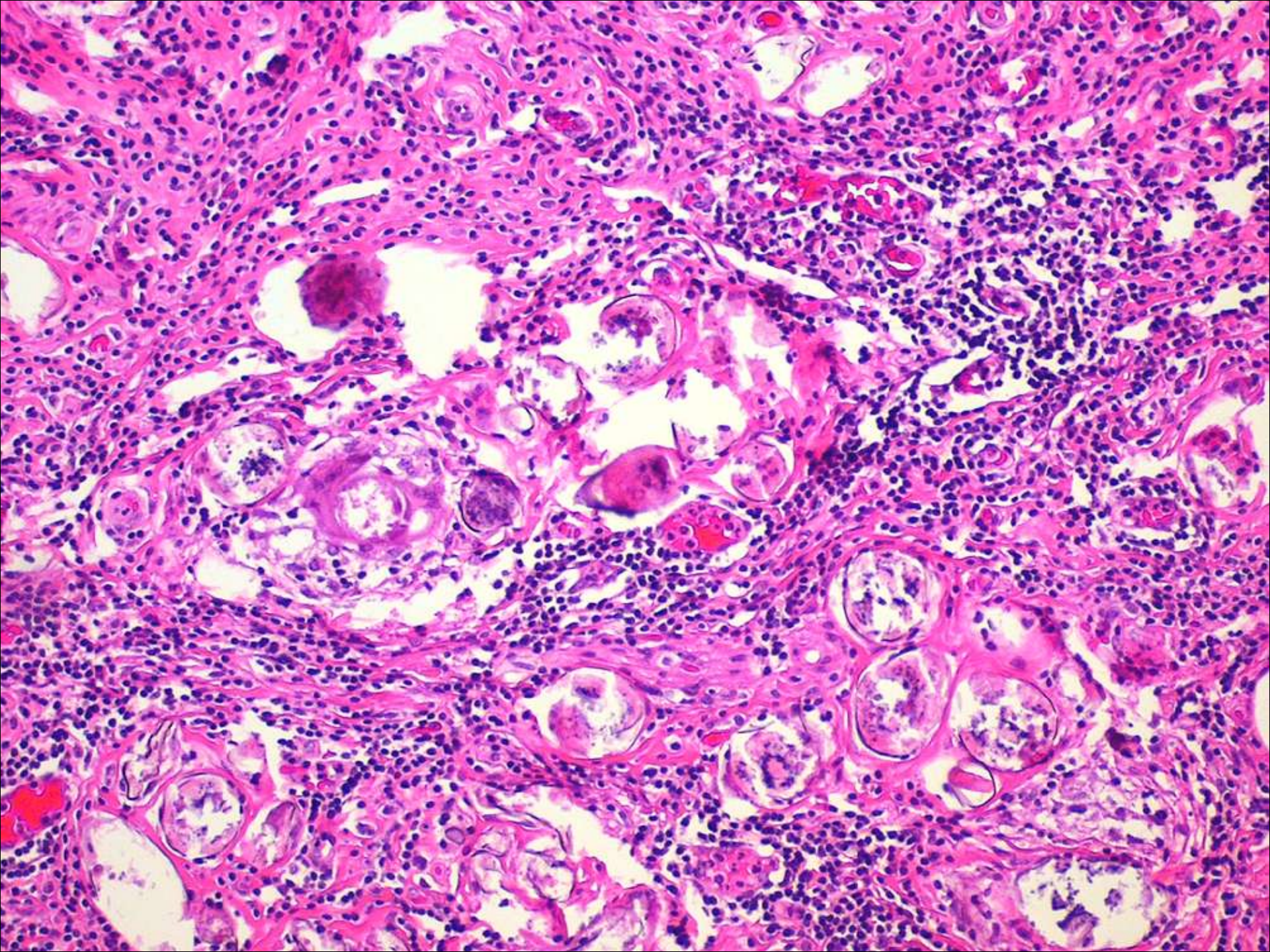
A black African F 28 presented with abdominal pain, fever and had a high WCC with a mild eosinophilia.

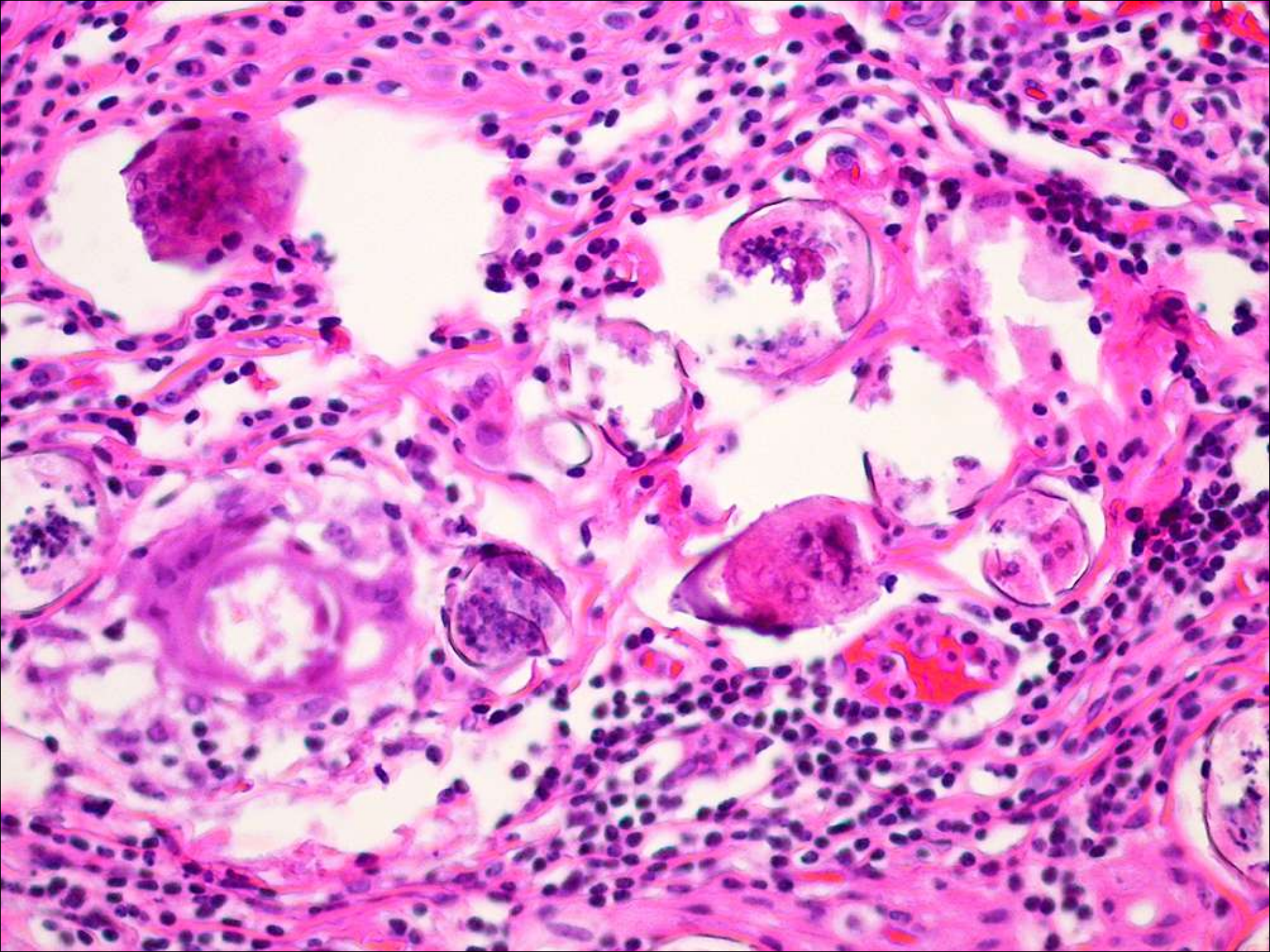
Appendicectomy.

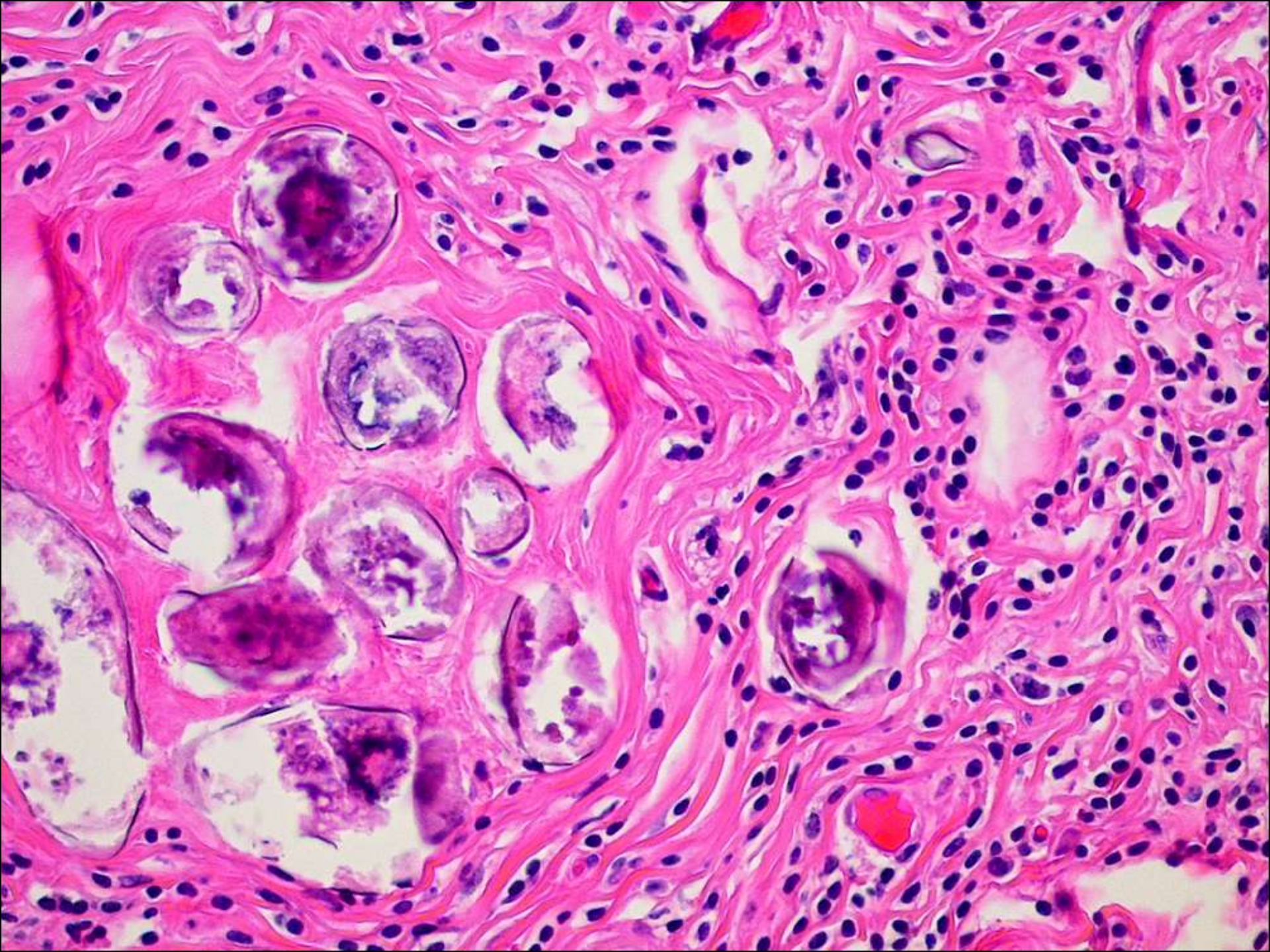
The appendix appeared uninflamed.

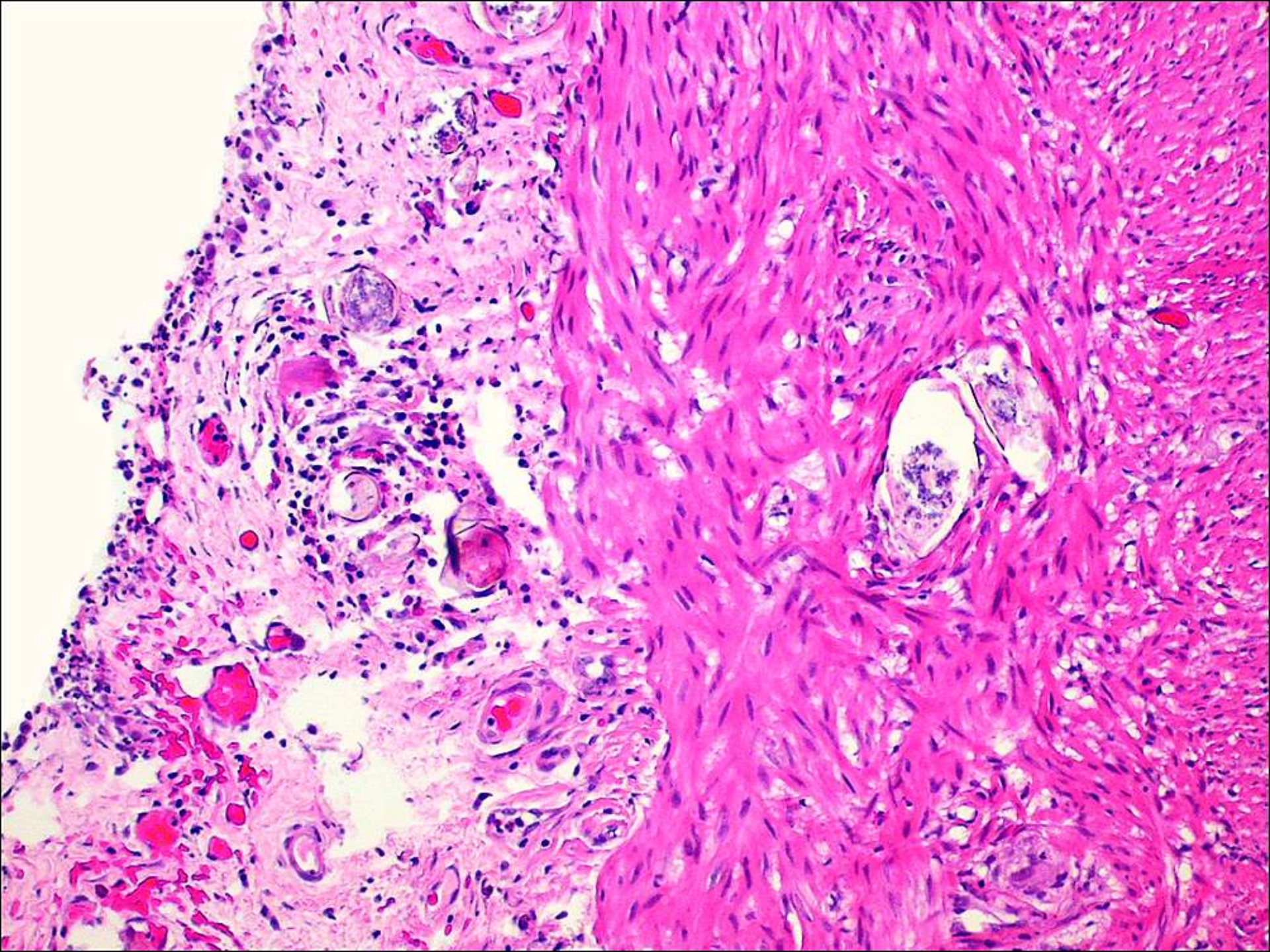


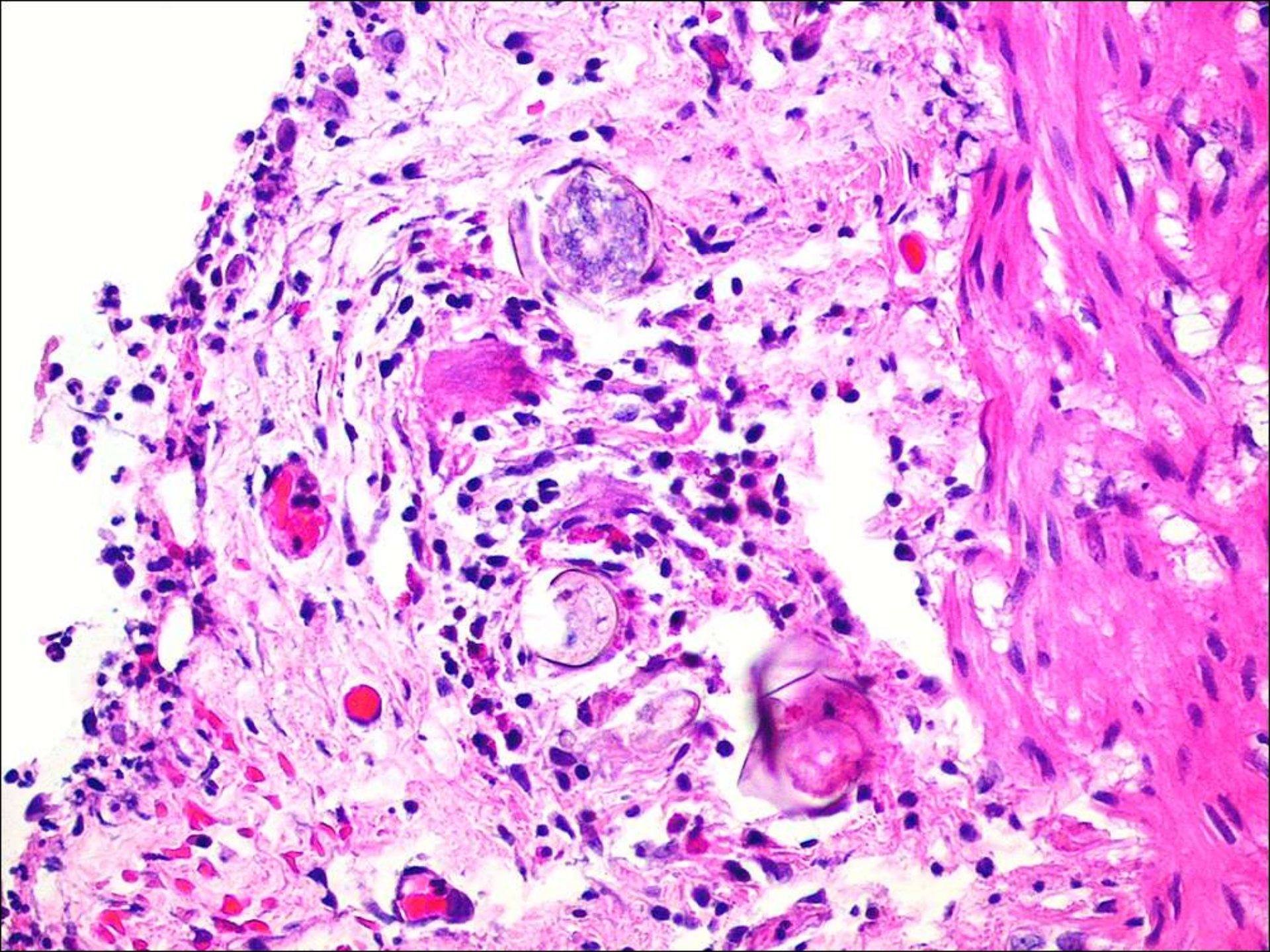


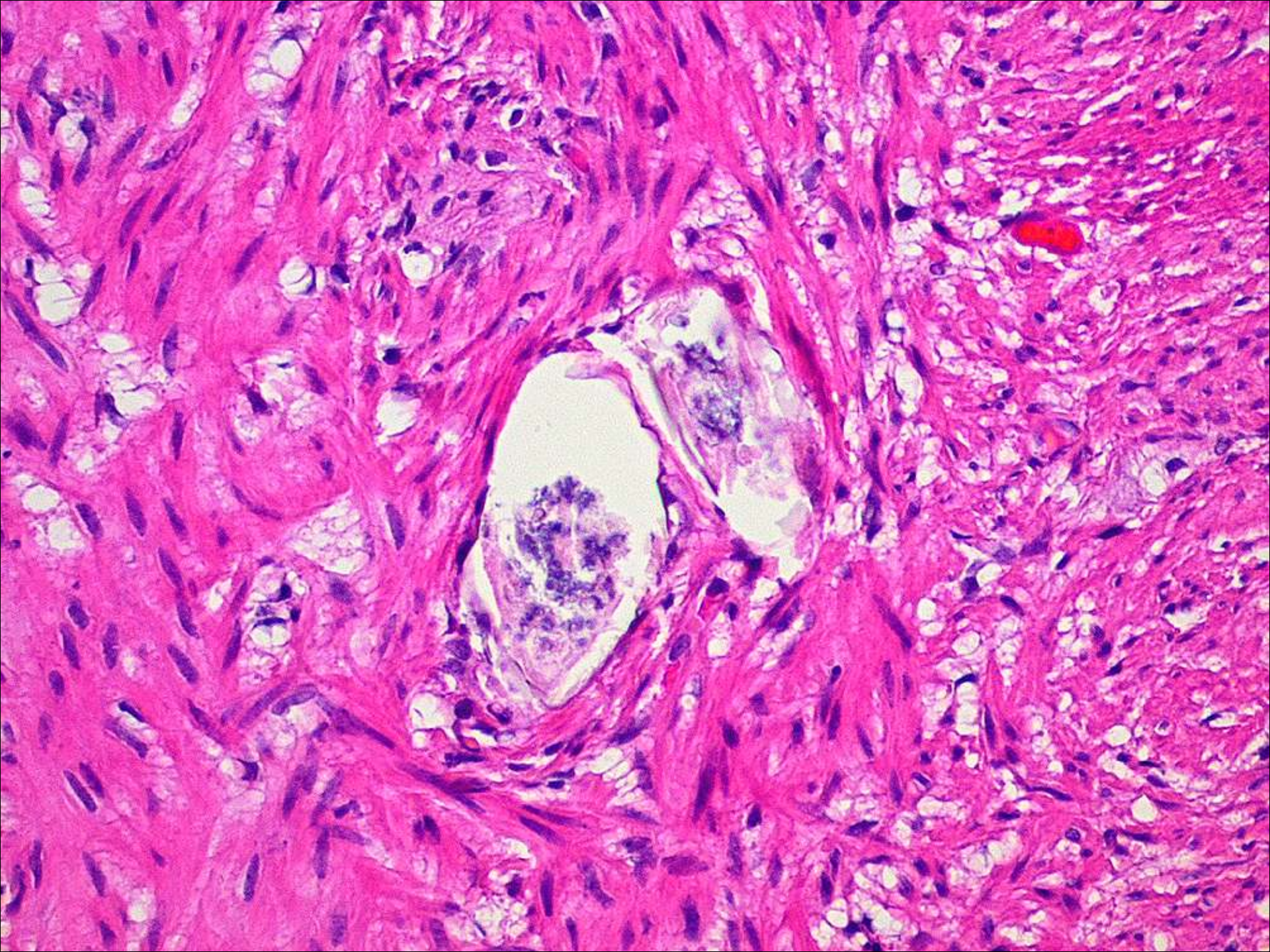


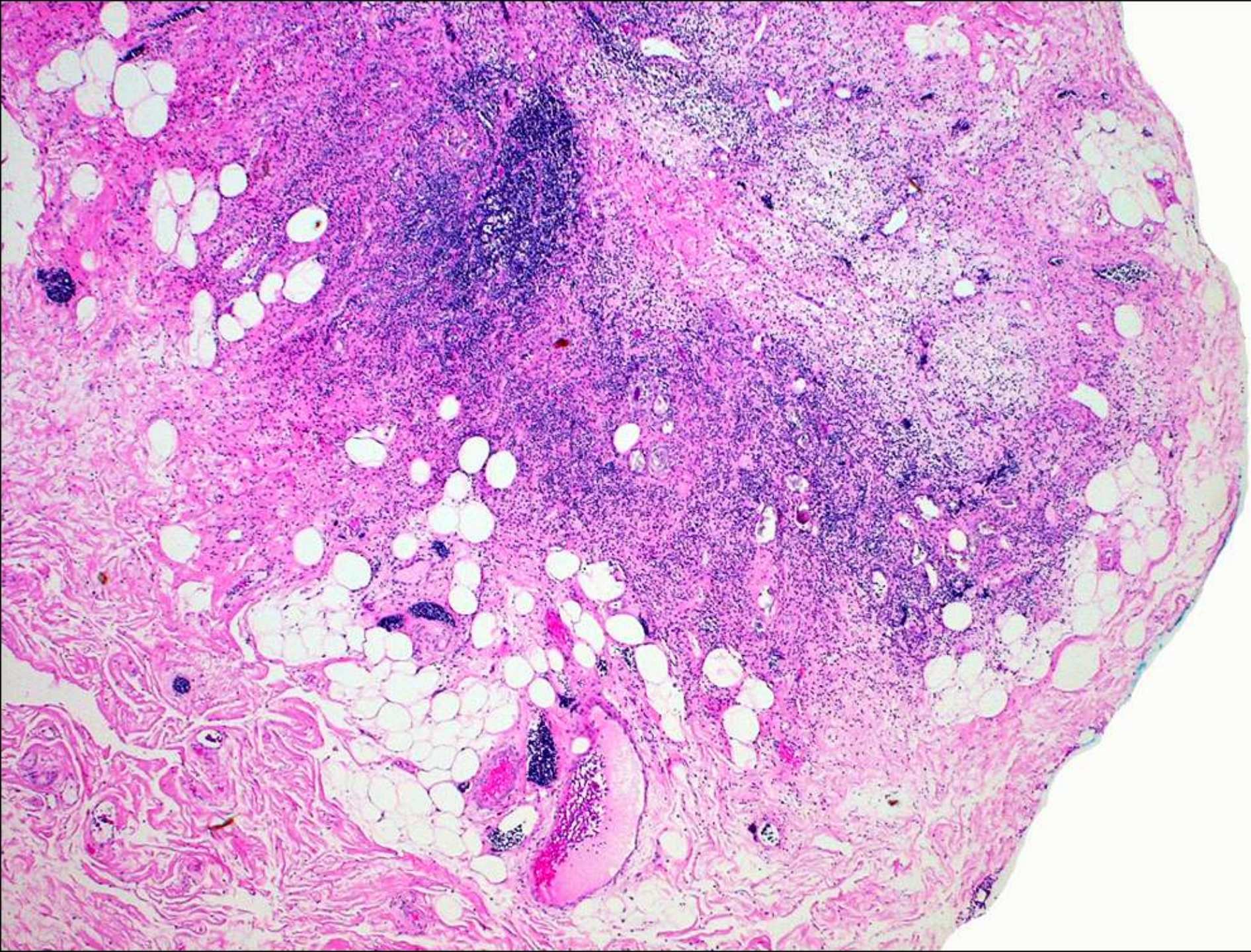


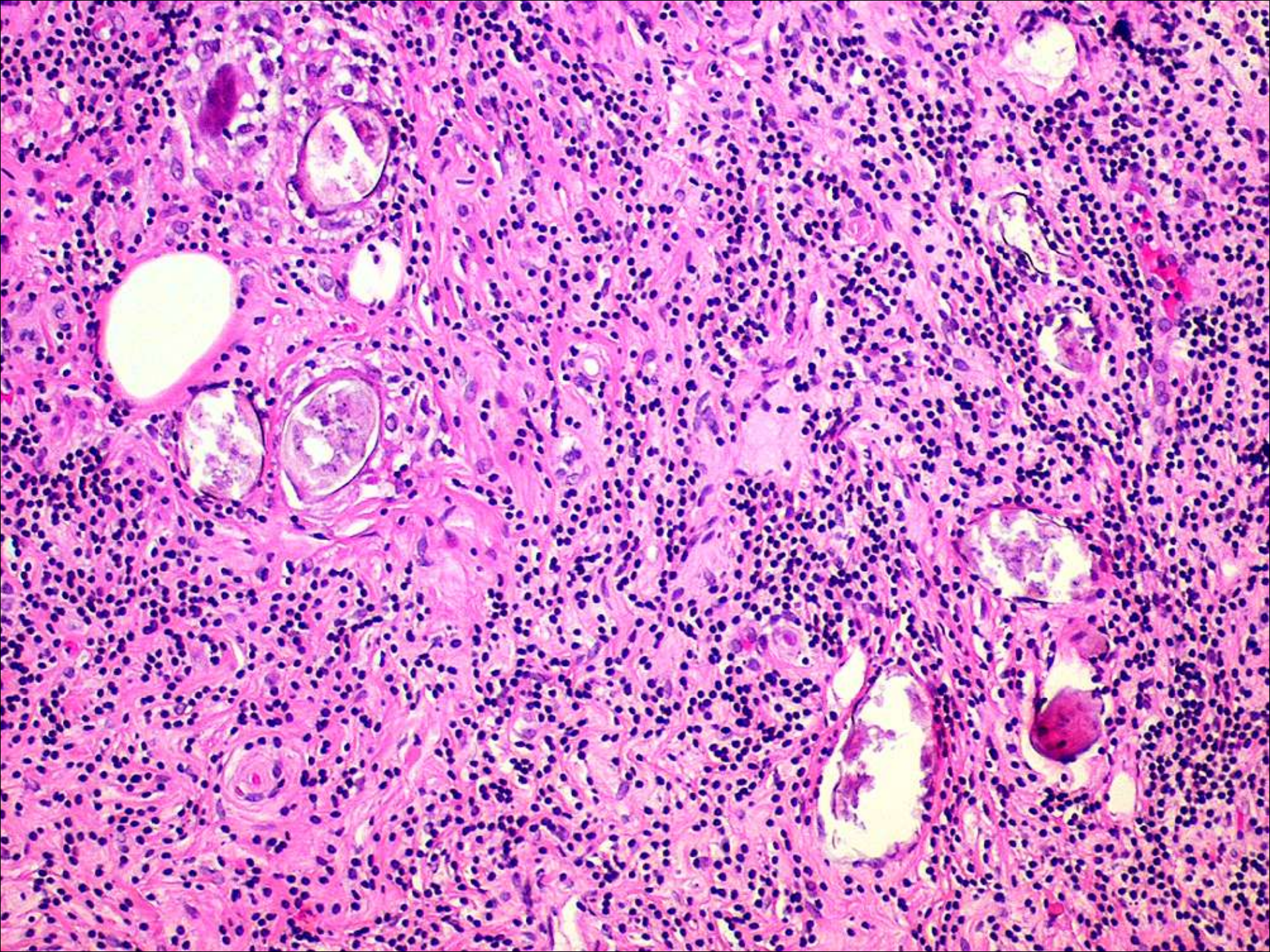


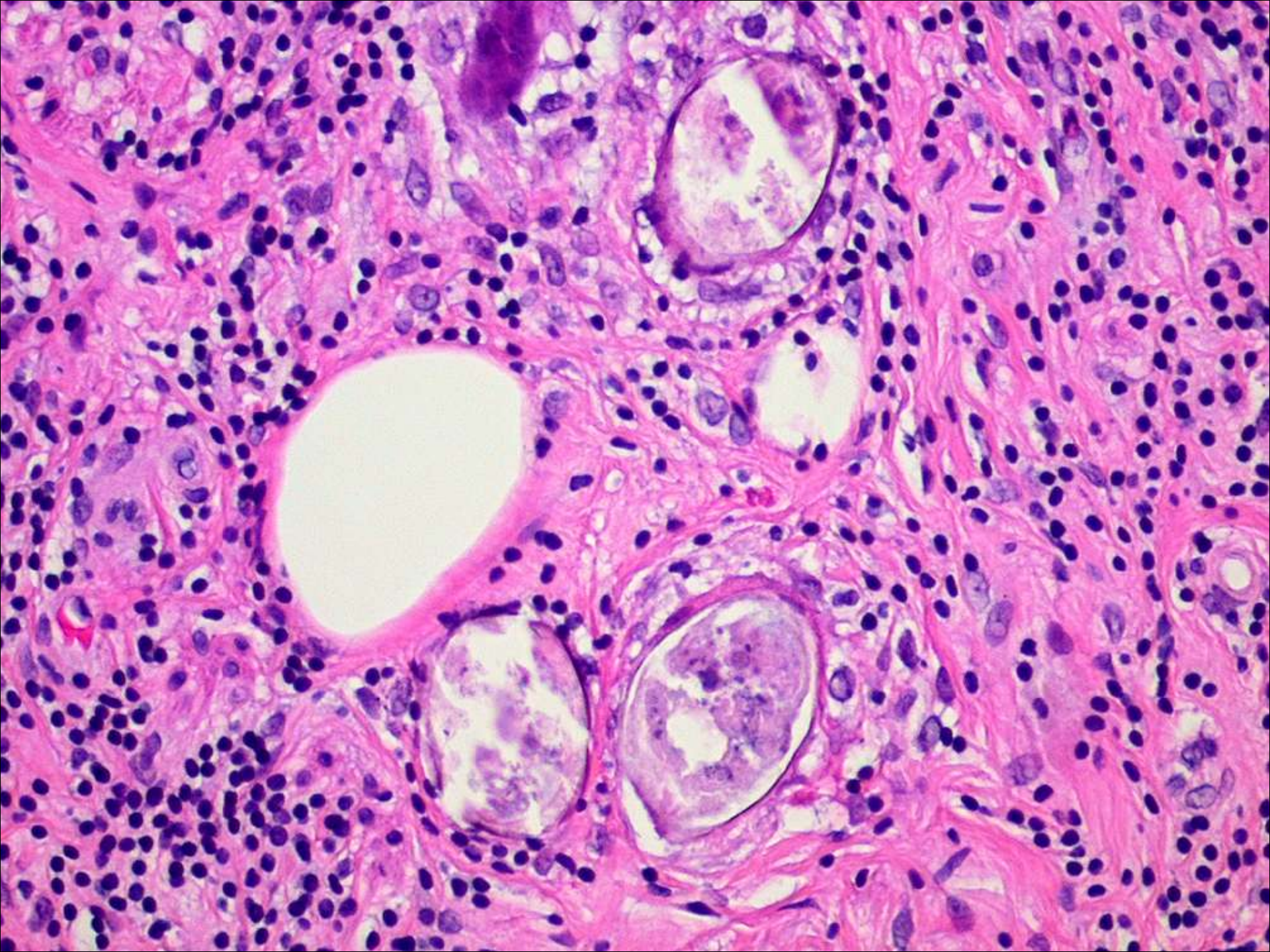












She was given a course of praziquantel

A 20 year old female presented in May 1995 with weight loss, recurrent attacks of colicky abdominal pain and diarrhoea with blood and mucus.

A week later she began to pass blood in her urine.

FBC showed an eosinophilia with 20% eosinophils.

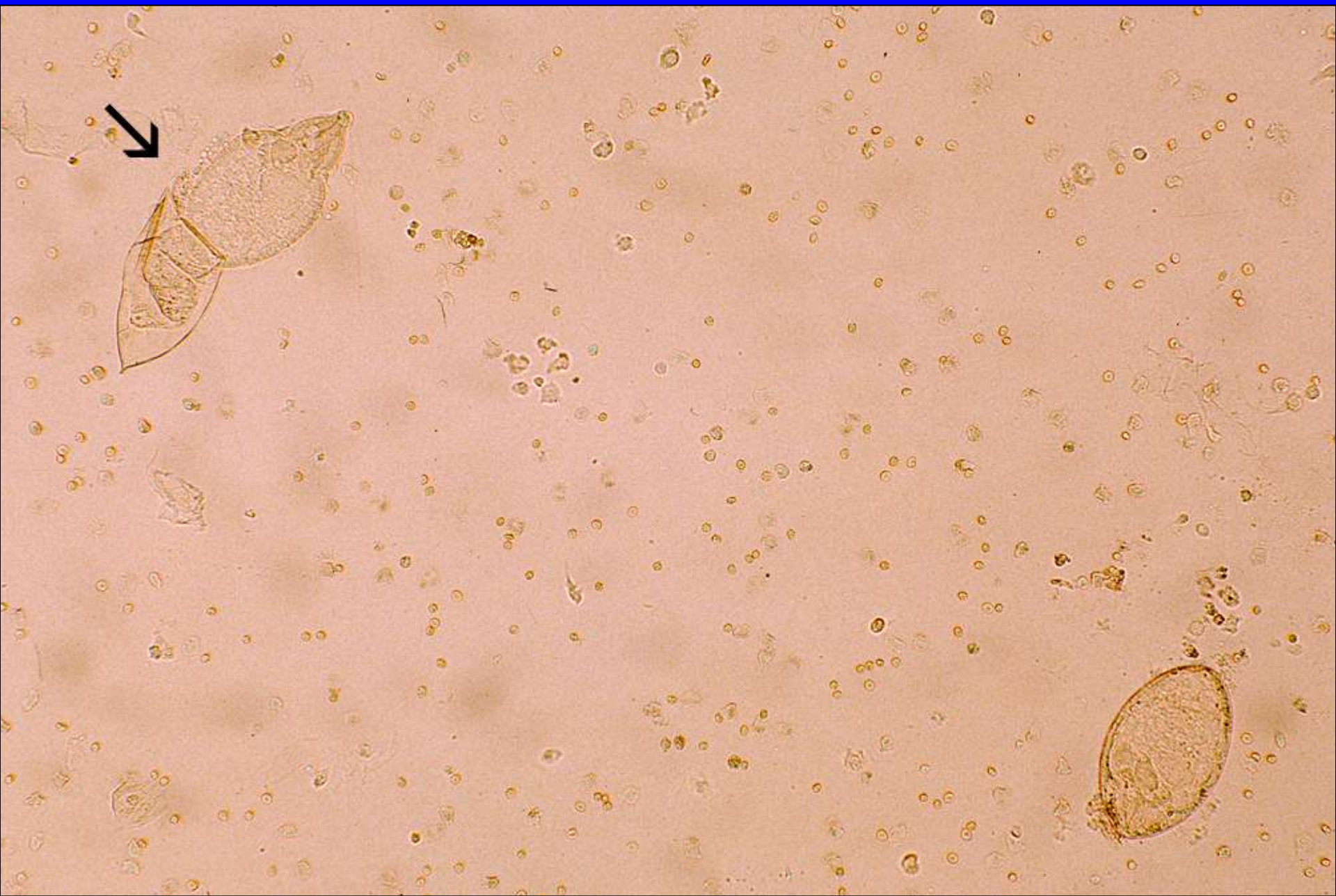
No parasites were found in her faeces.

Microurine showed *S. haematobium* ova which were maturing to actively motile miracidia.

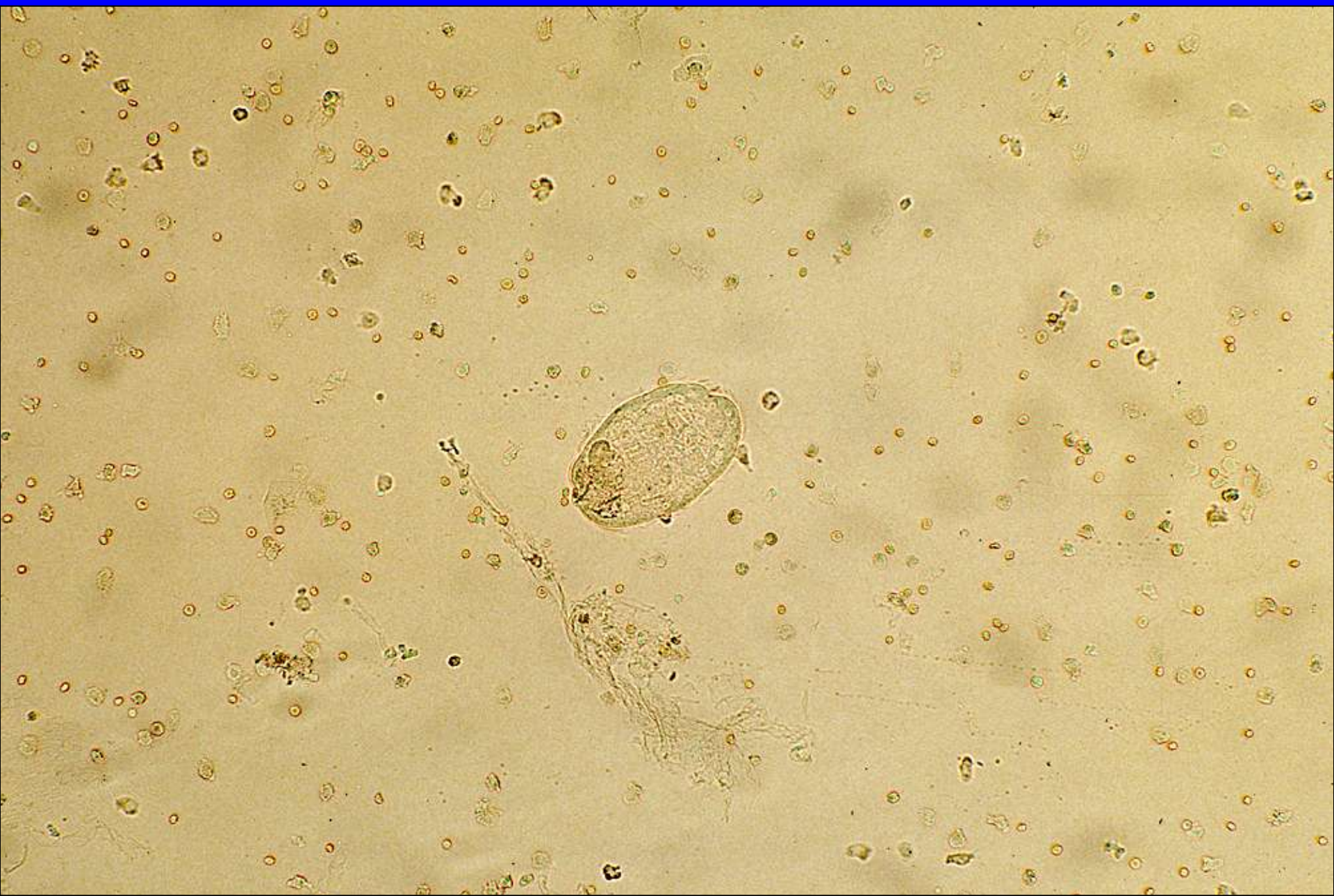
Four weeks previously she had returned from a trip to southern Africa which included a visit to Lake Malawi.





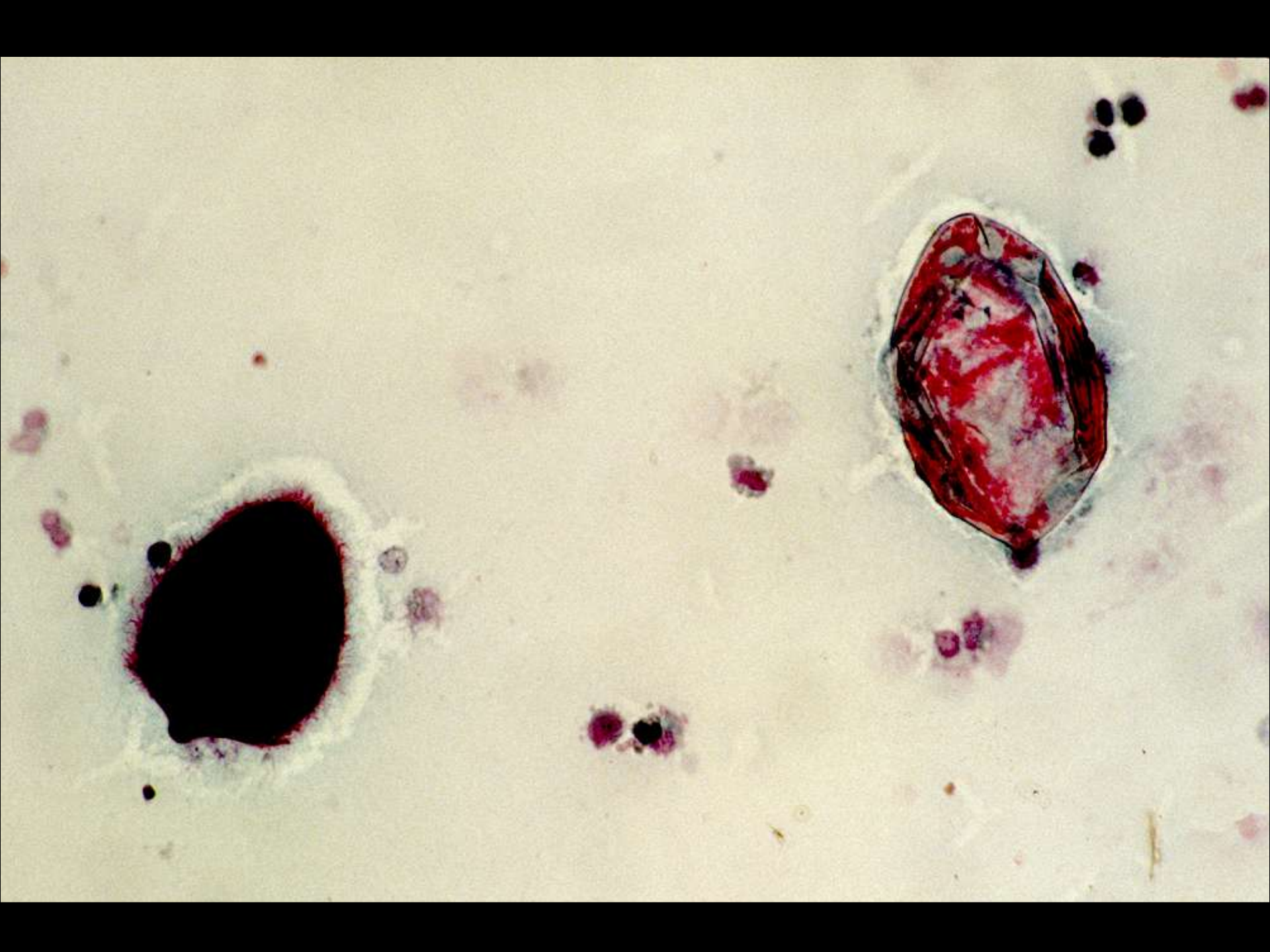


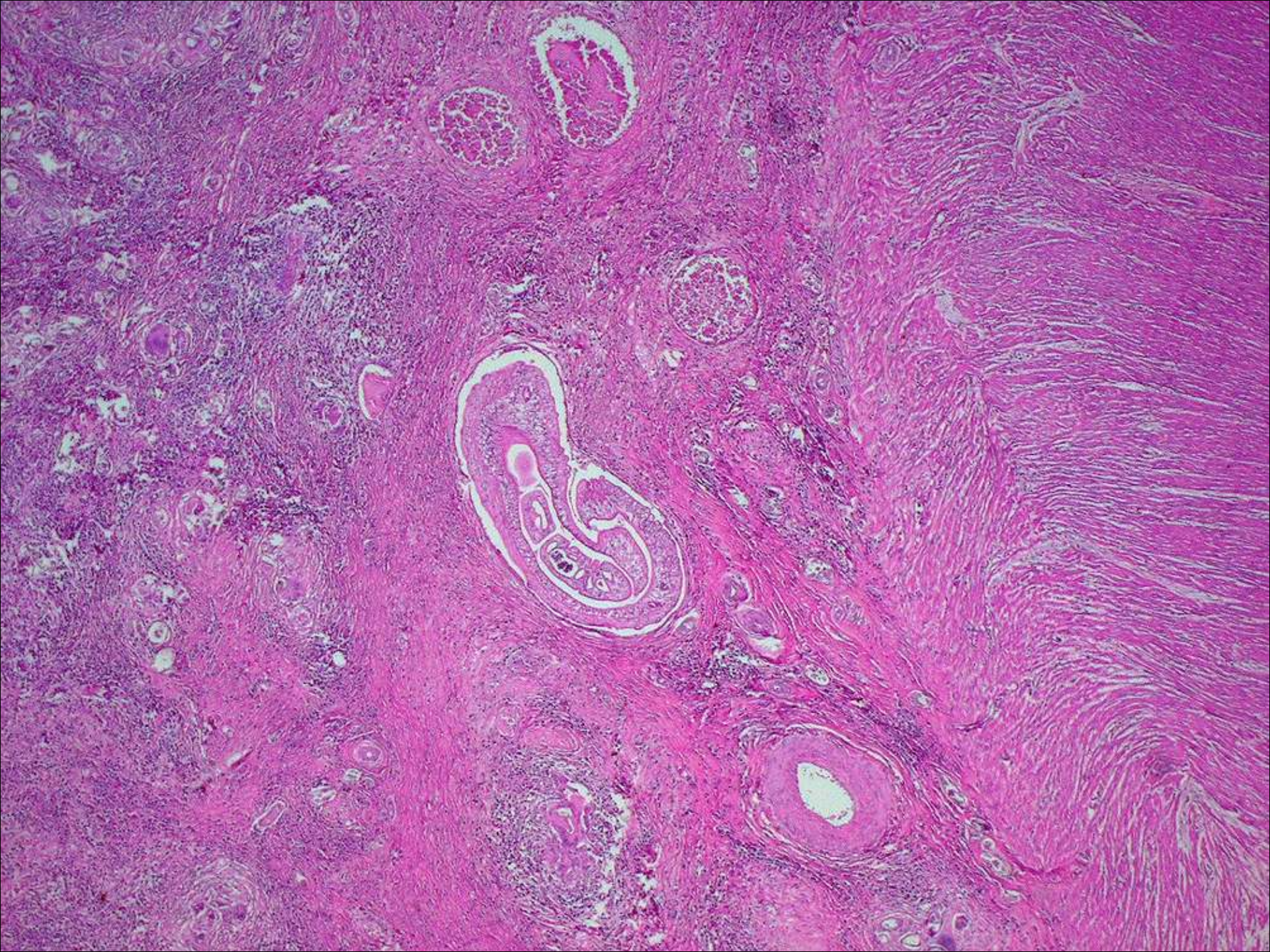


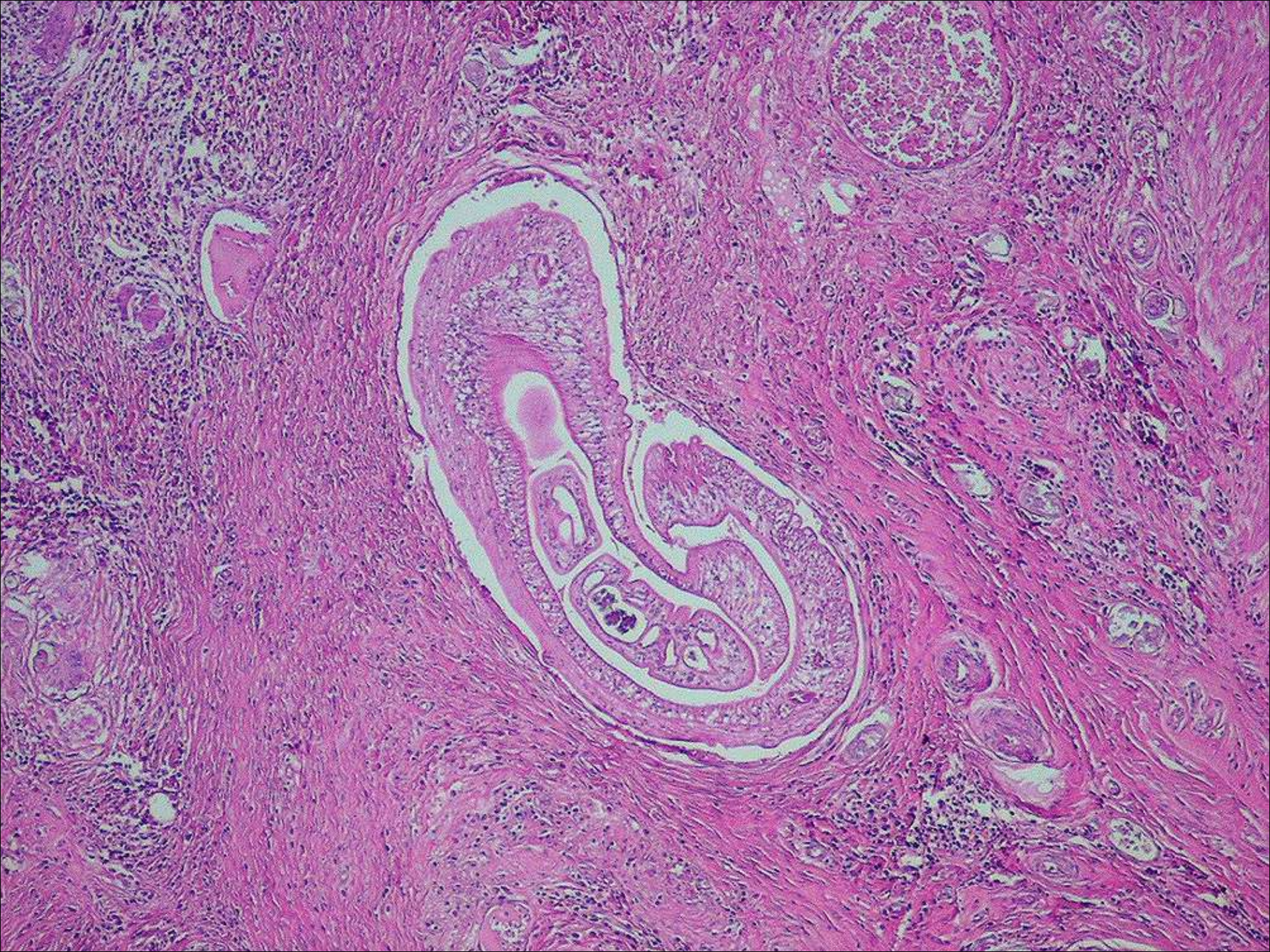


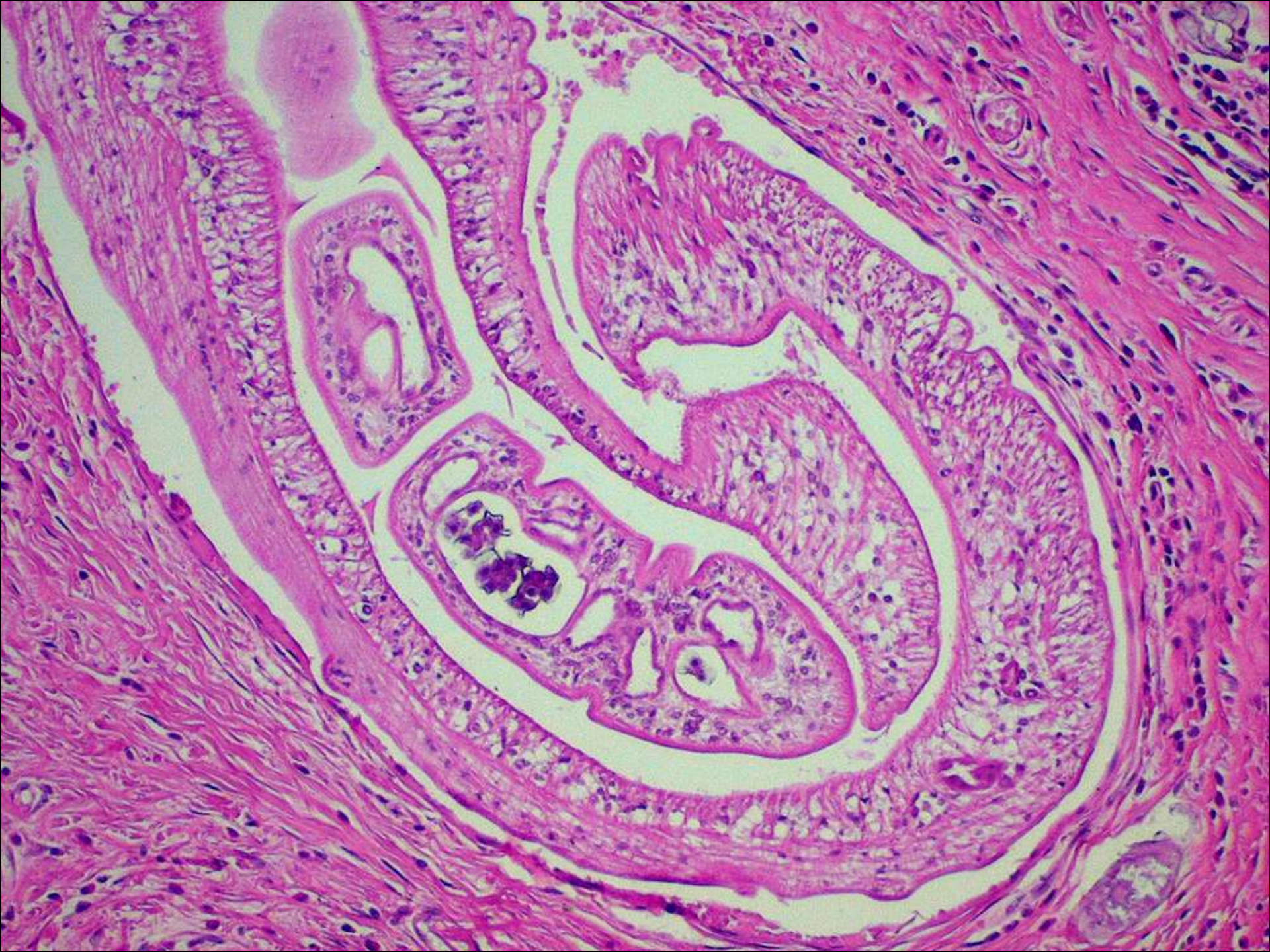


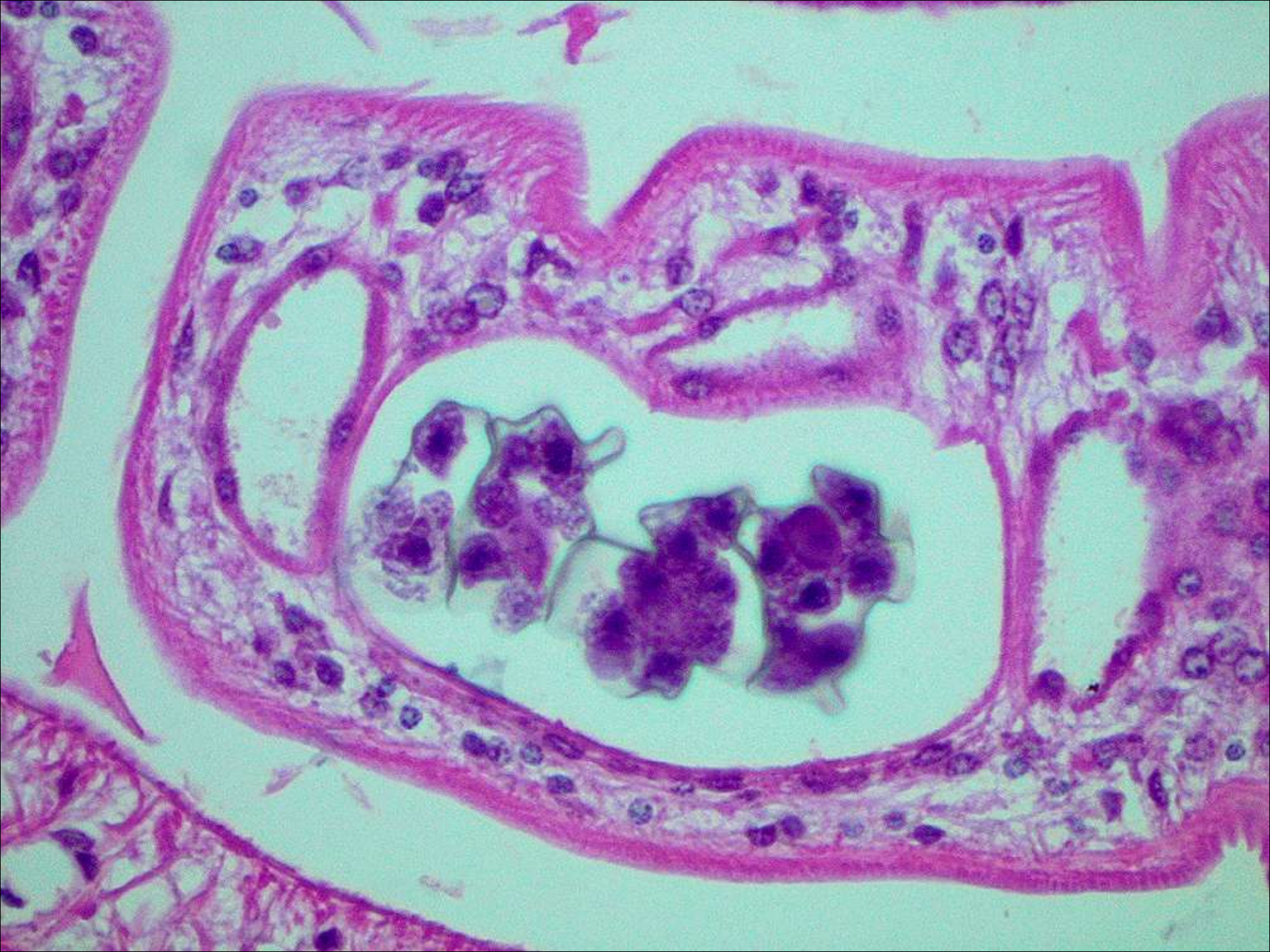


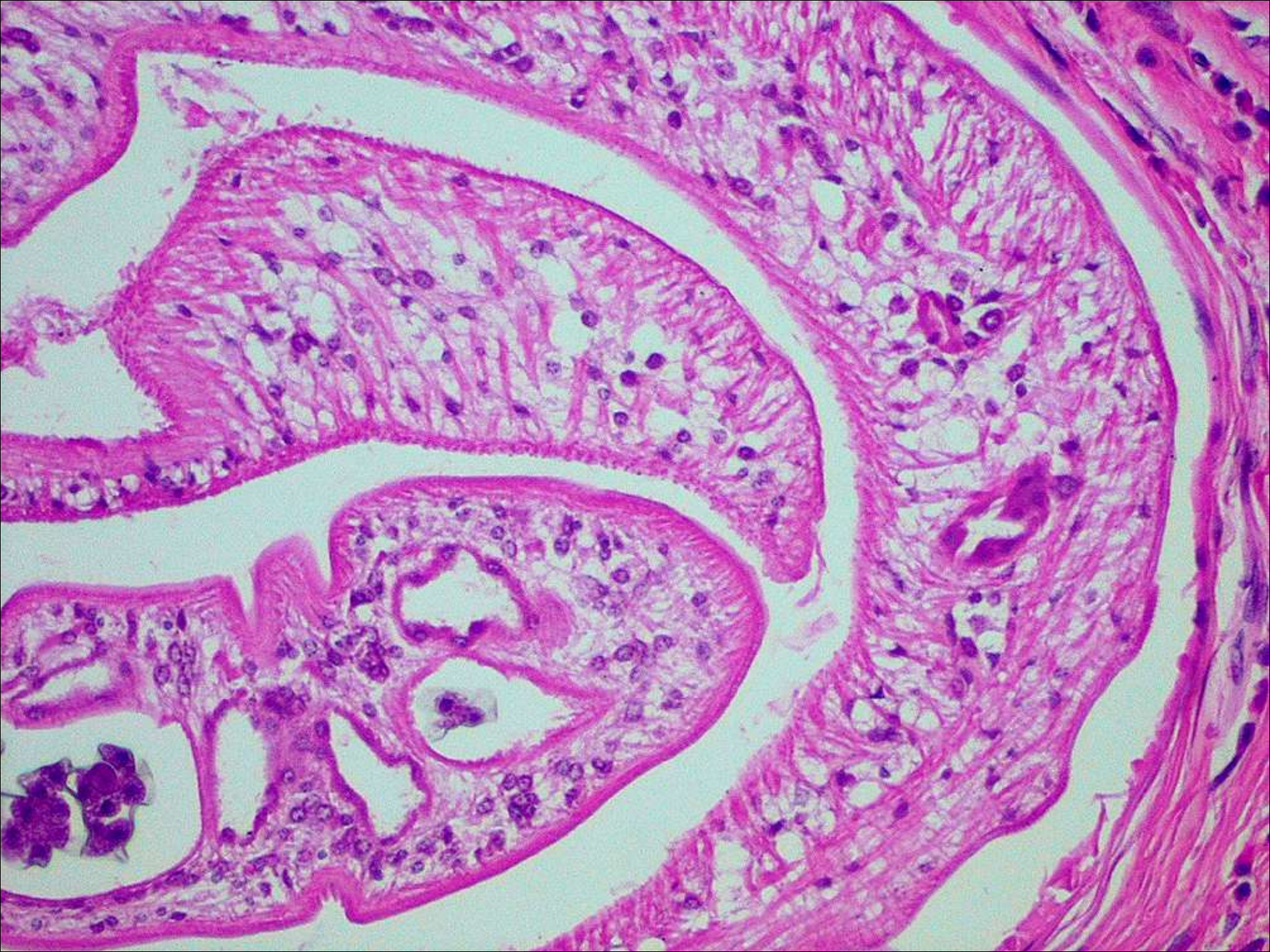




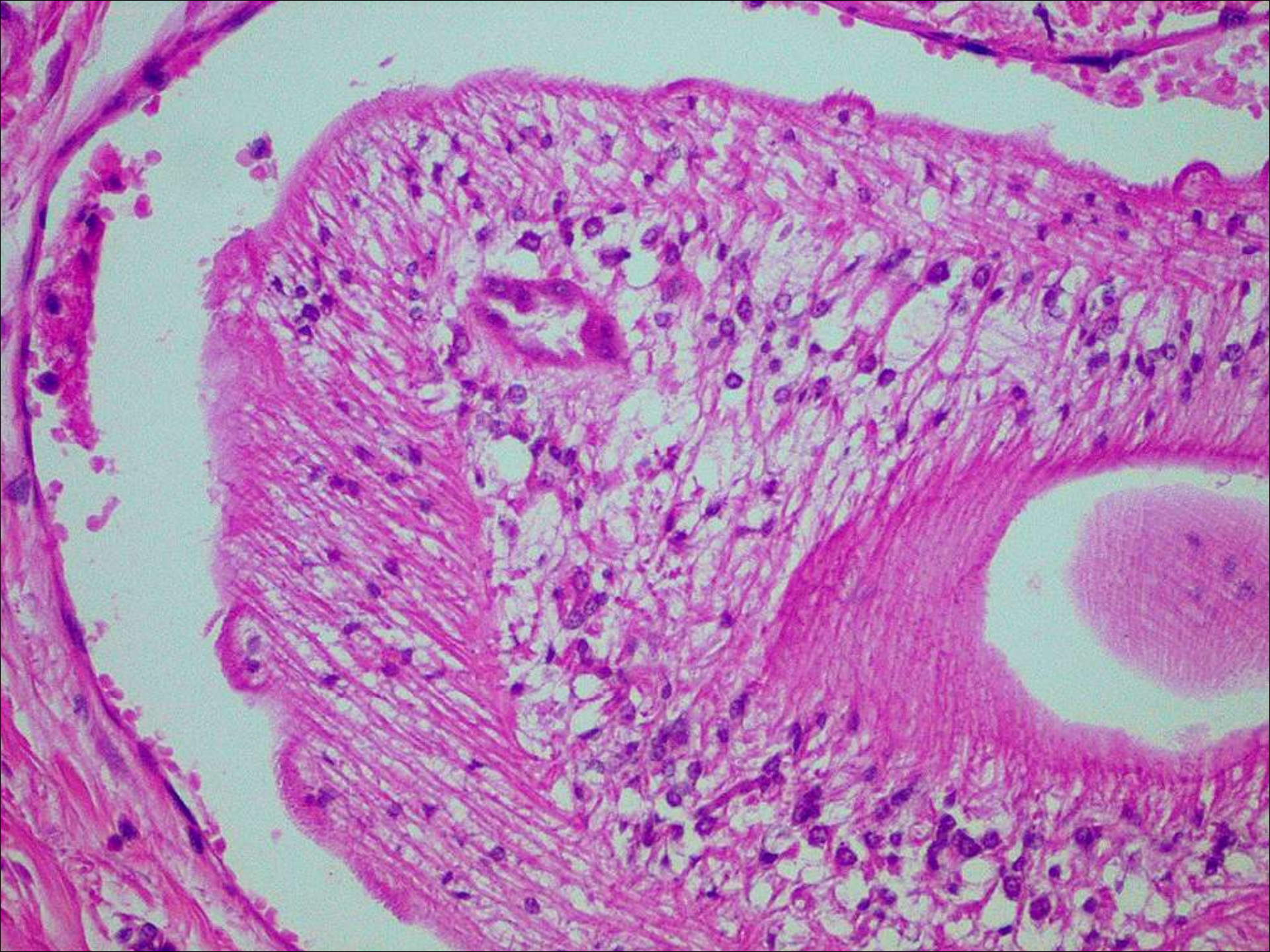


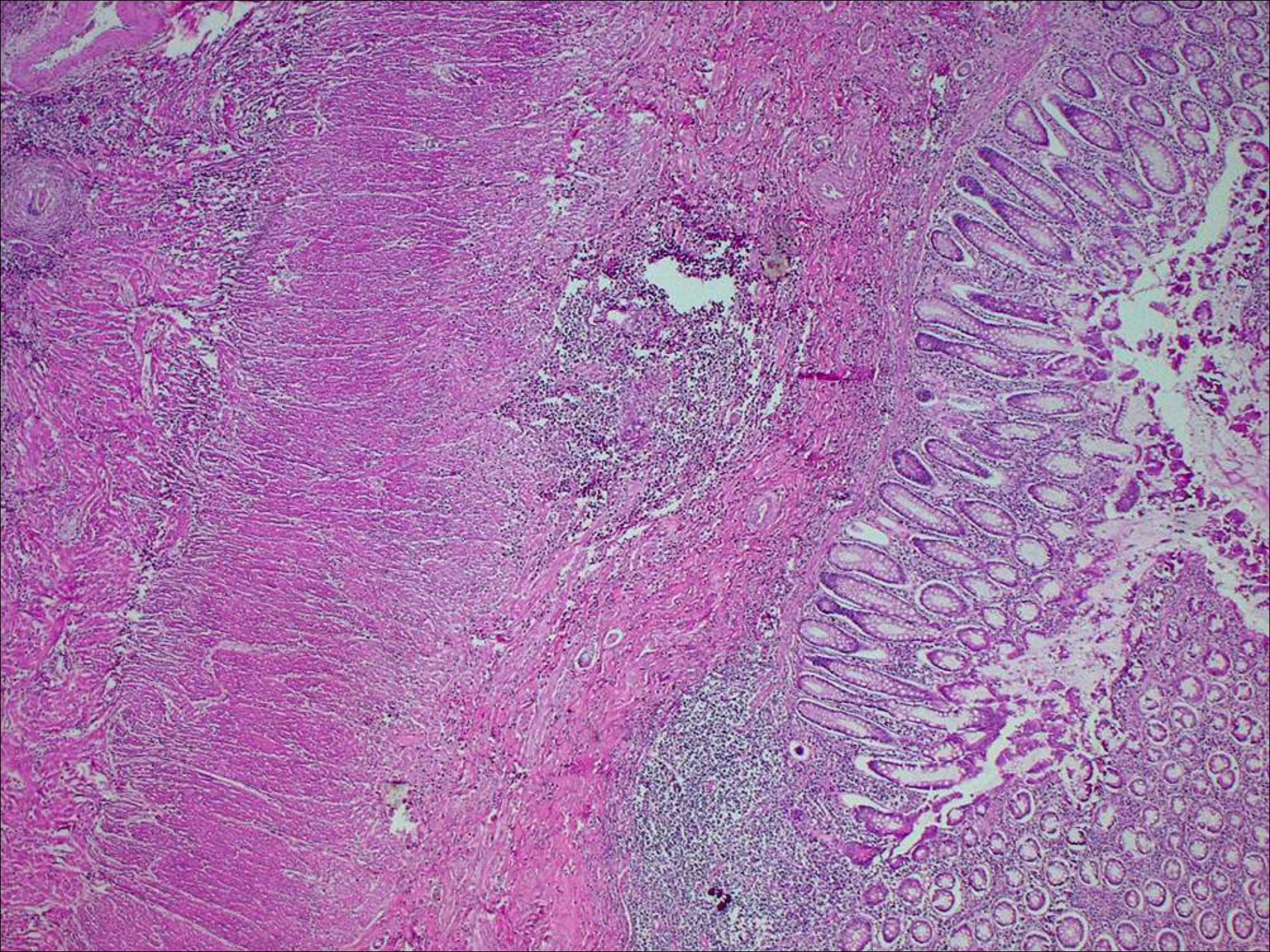


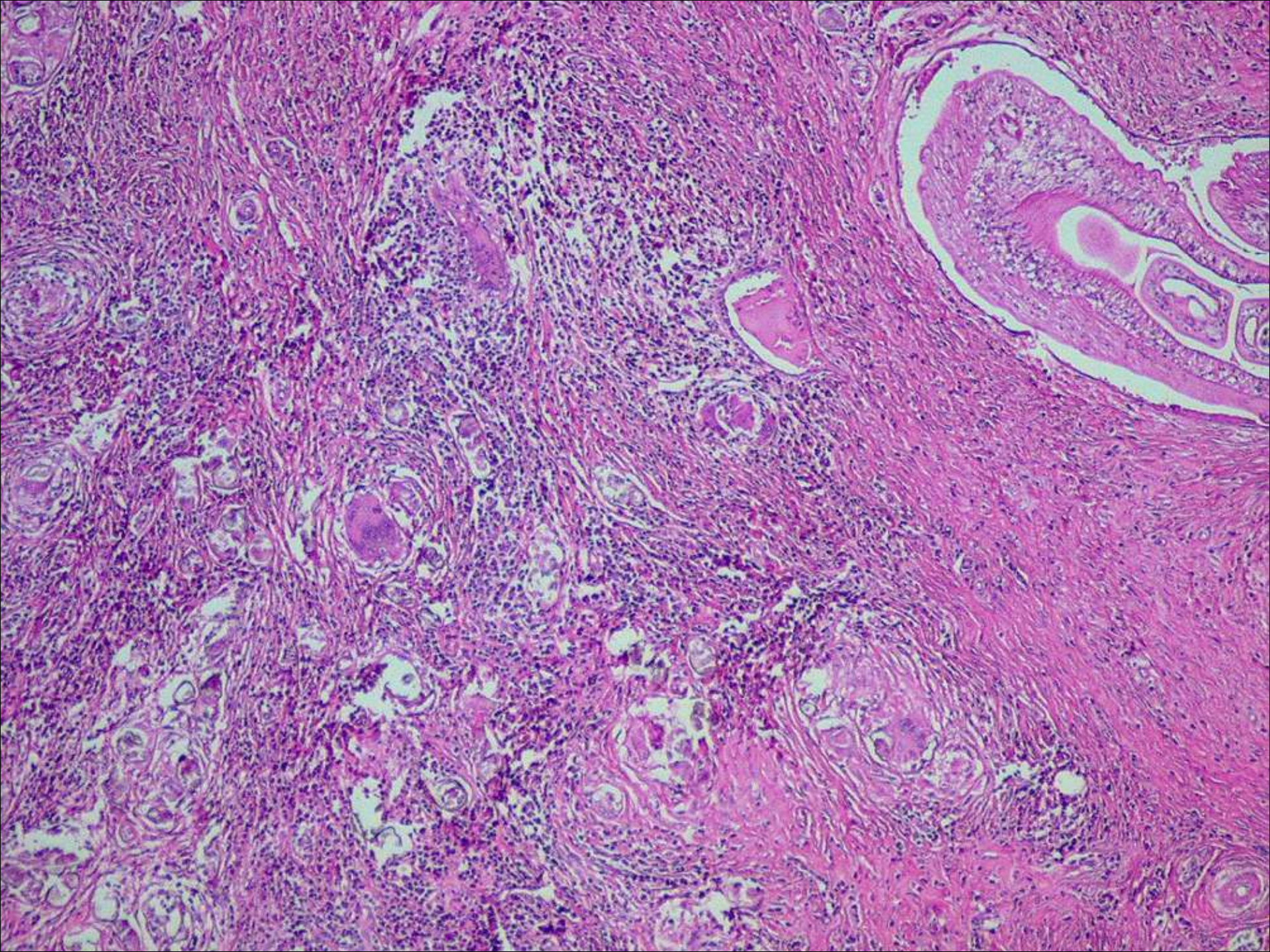


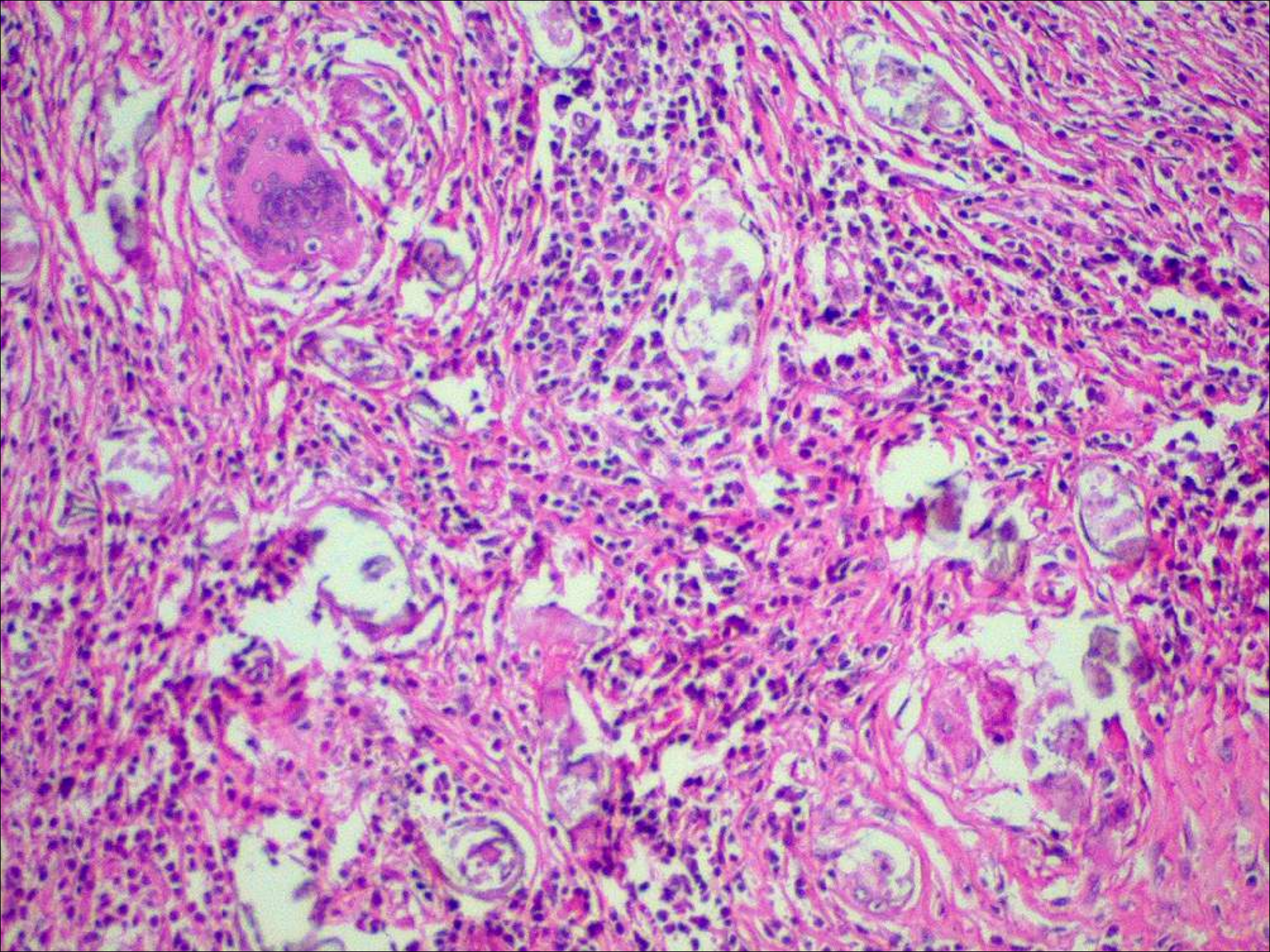


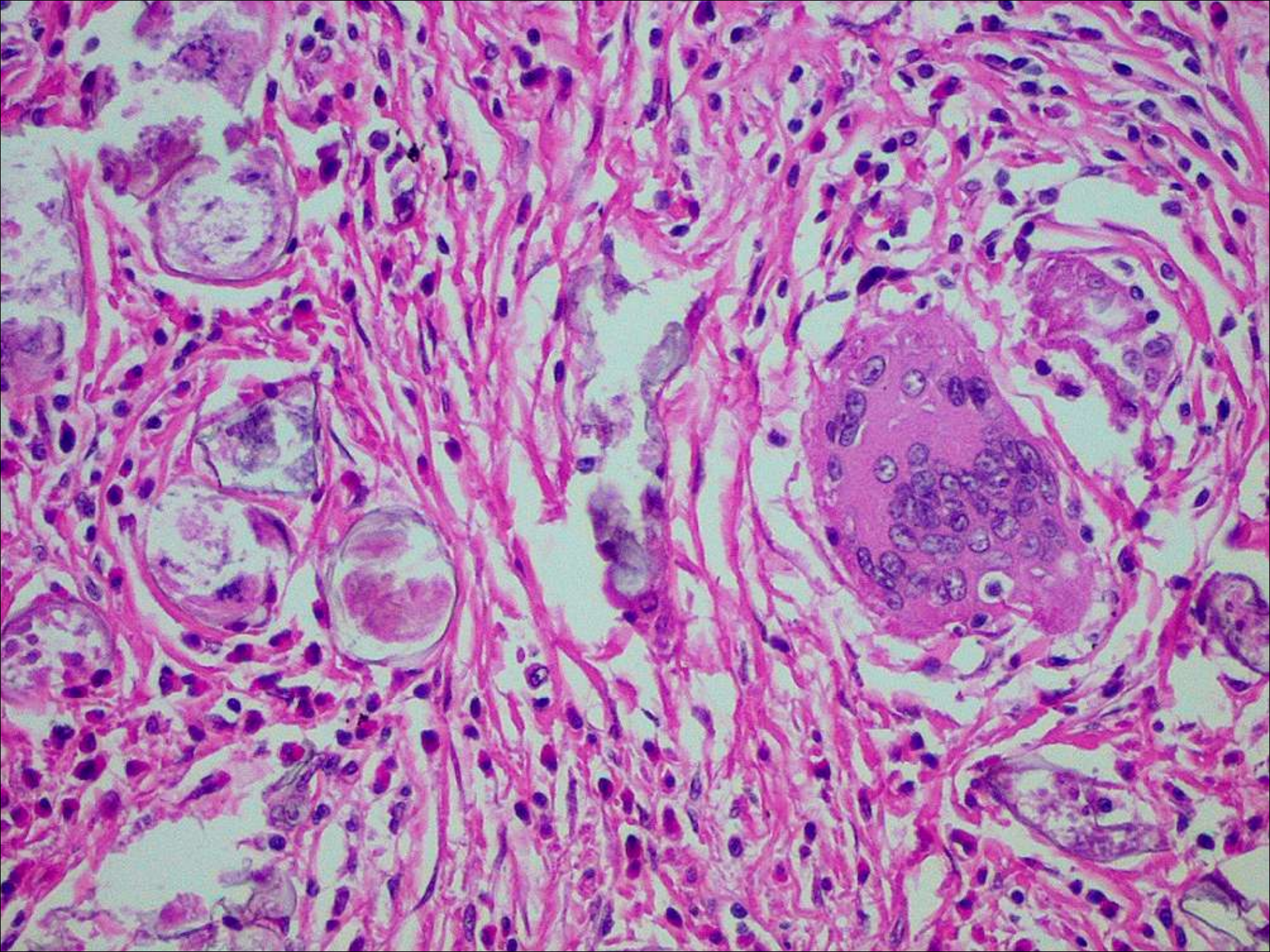


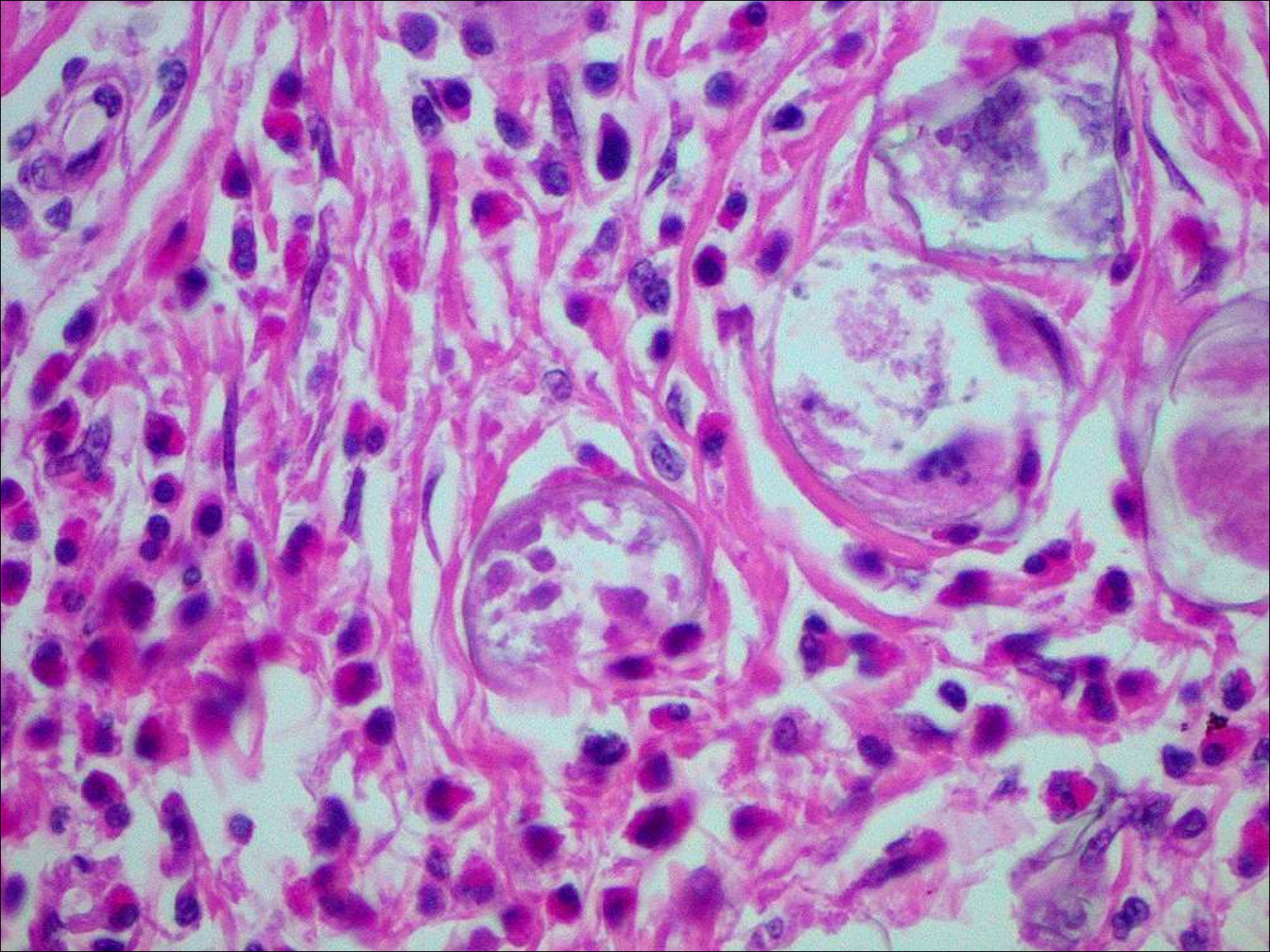




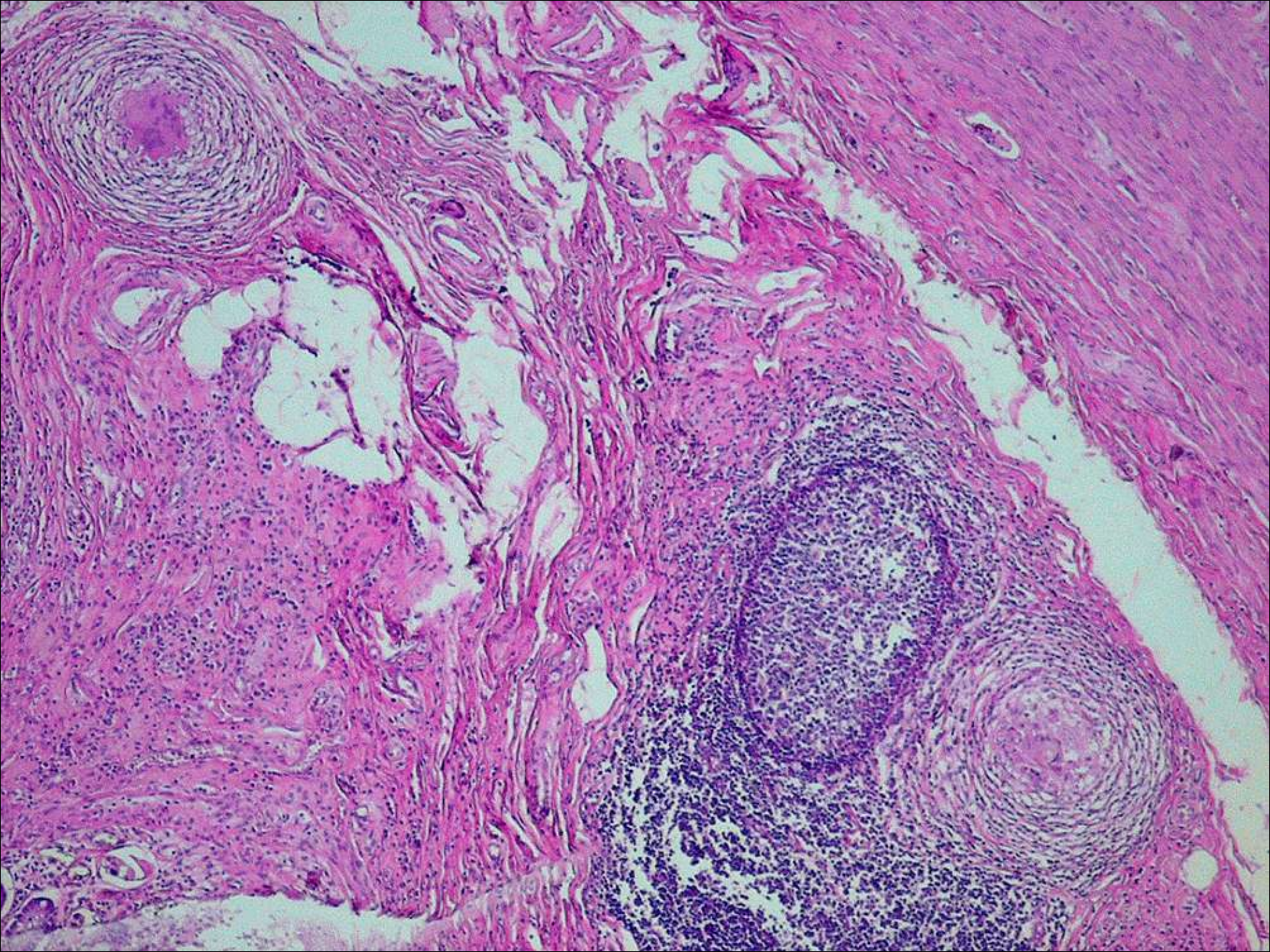


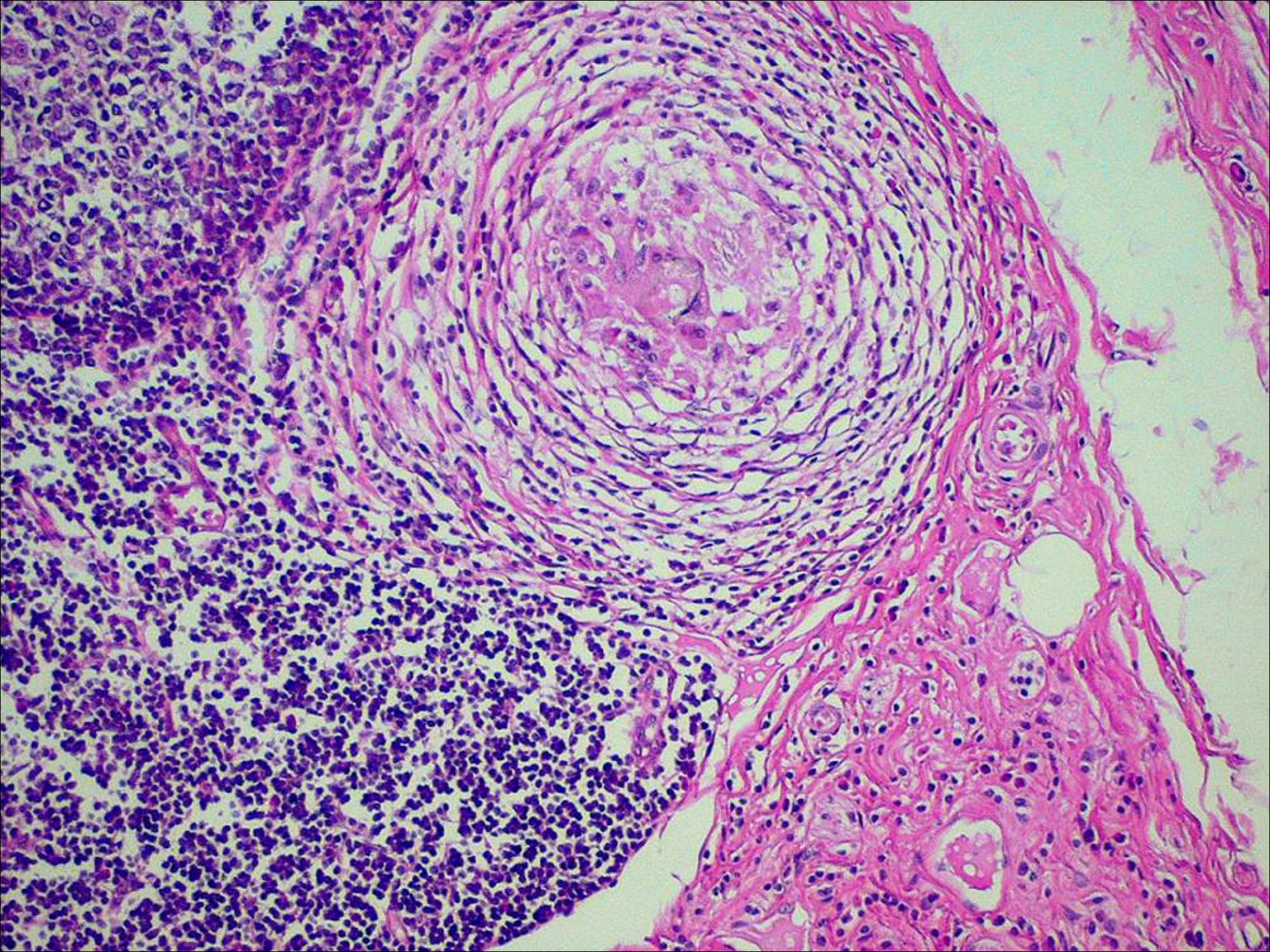


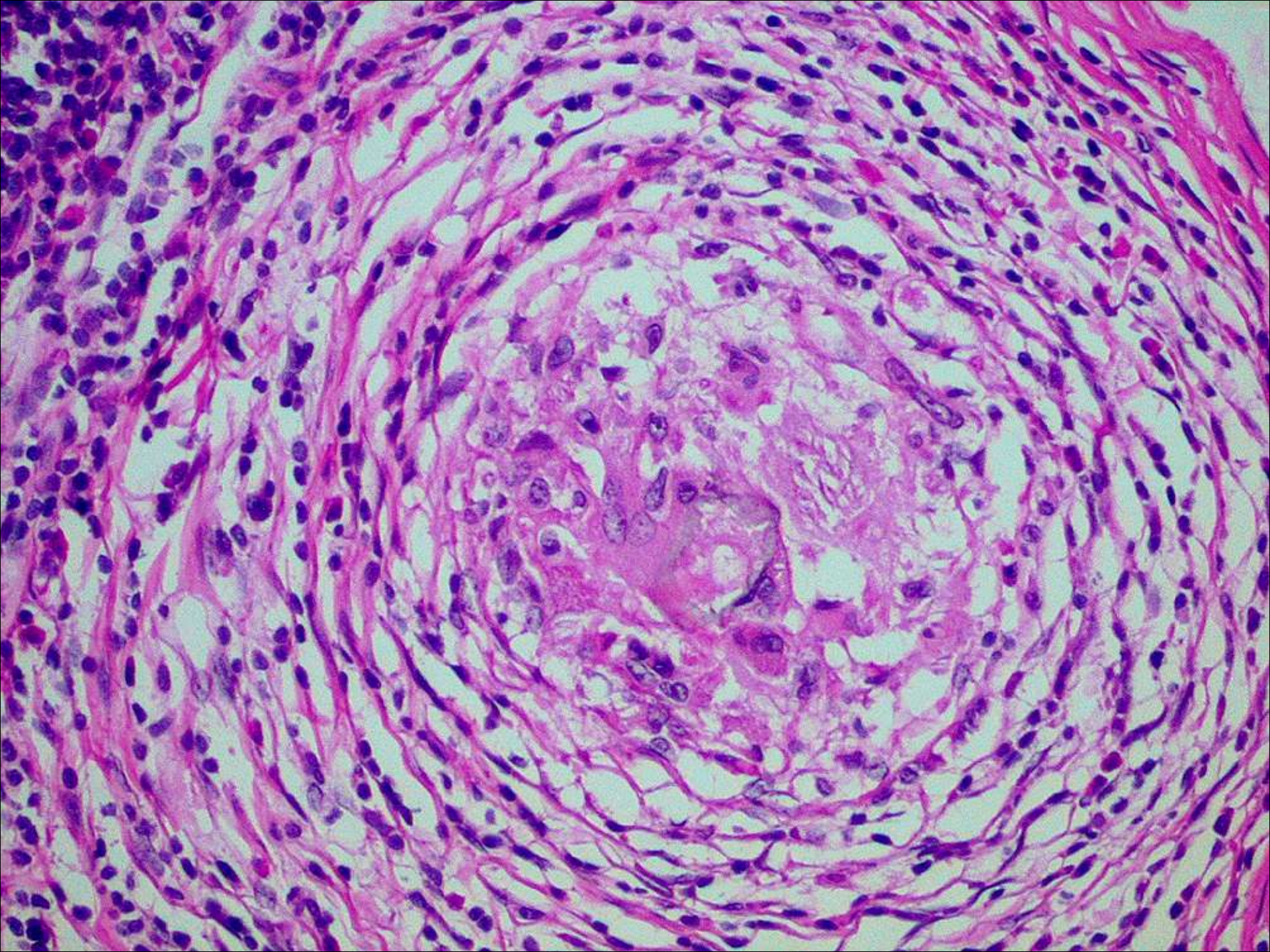


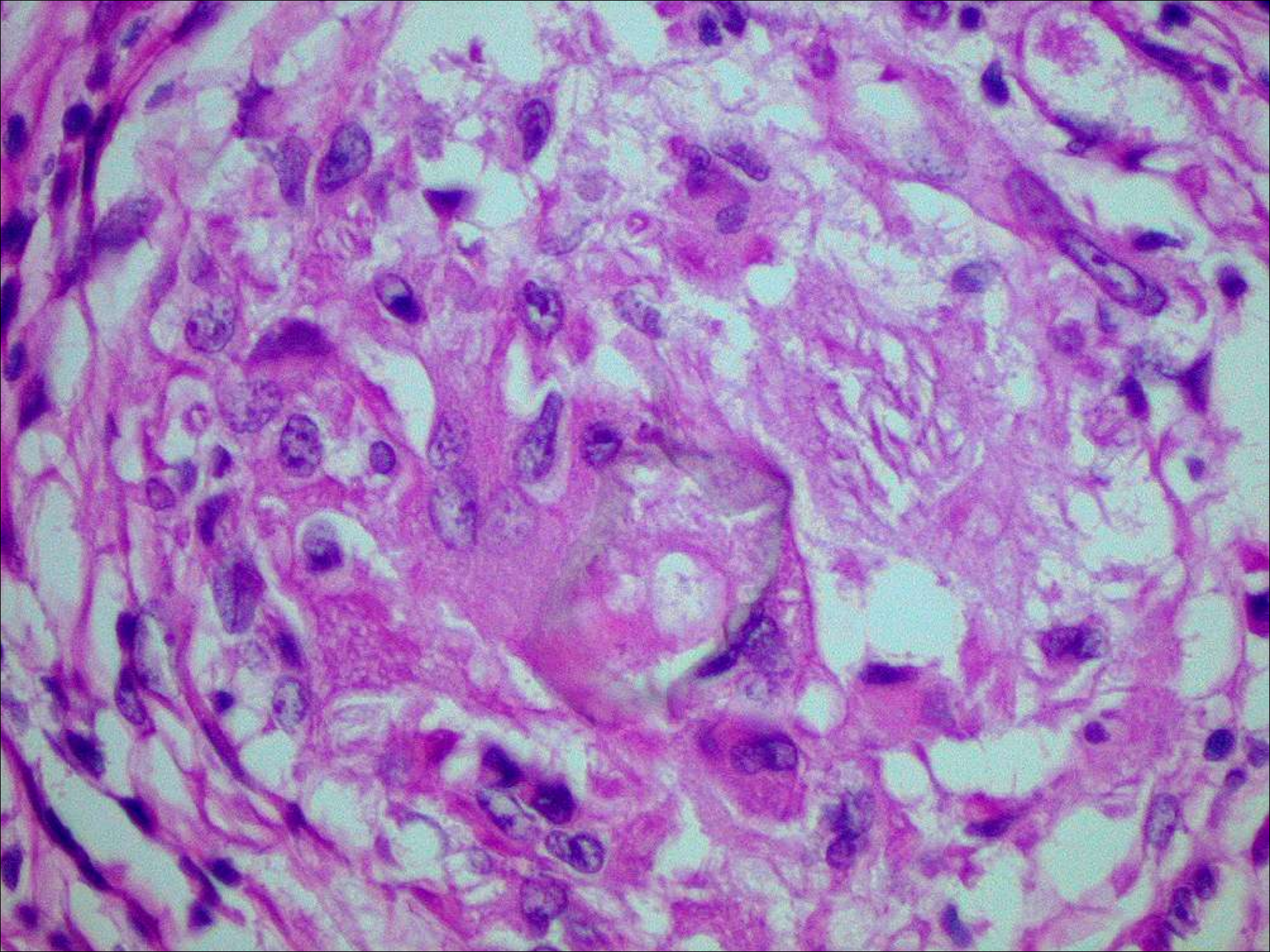












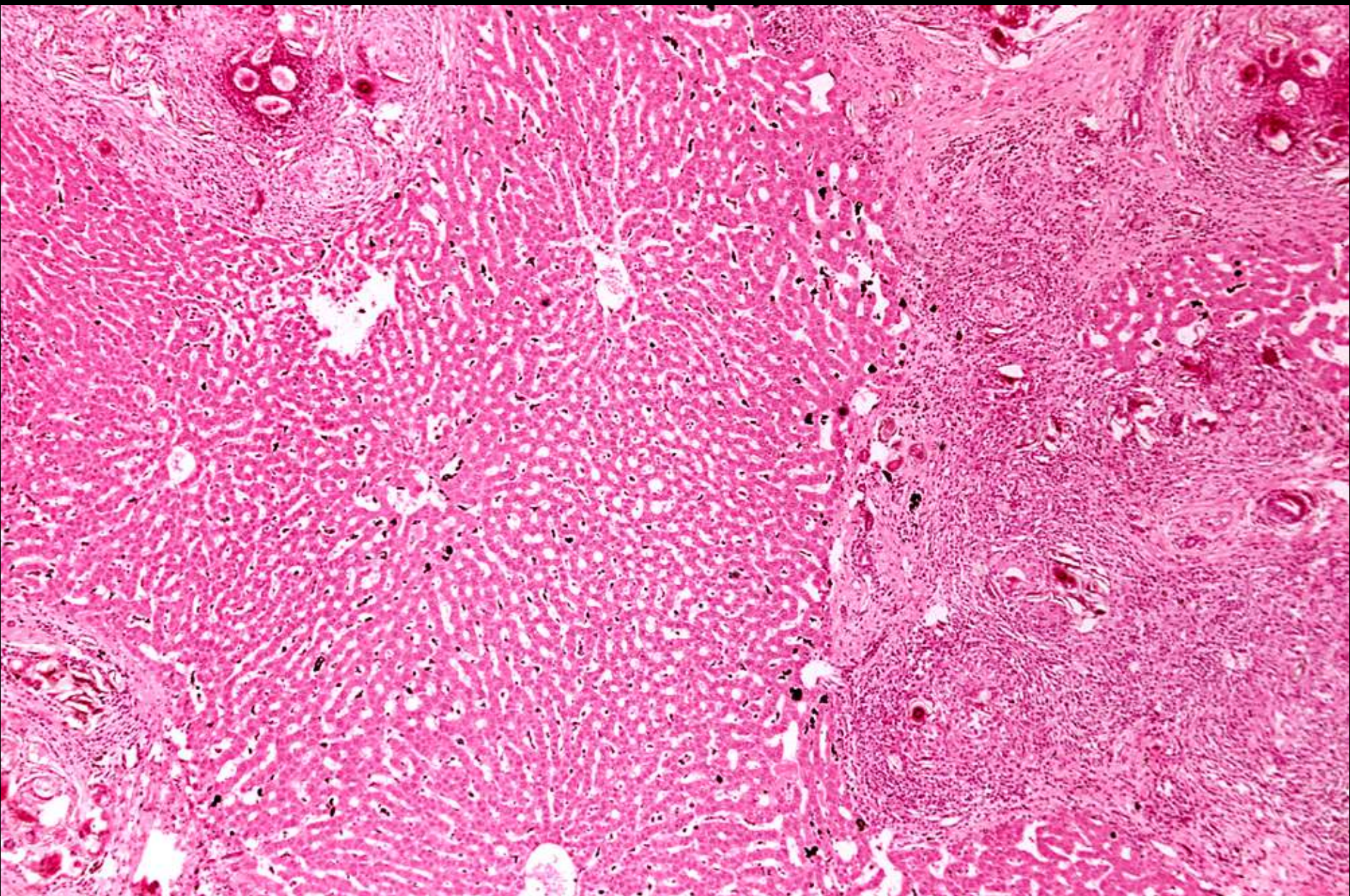
Further history on this case

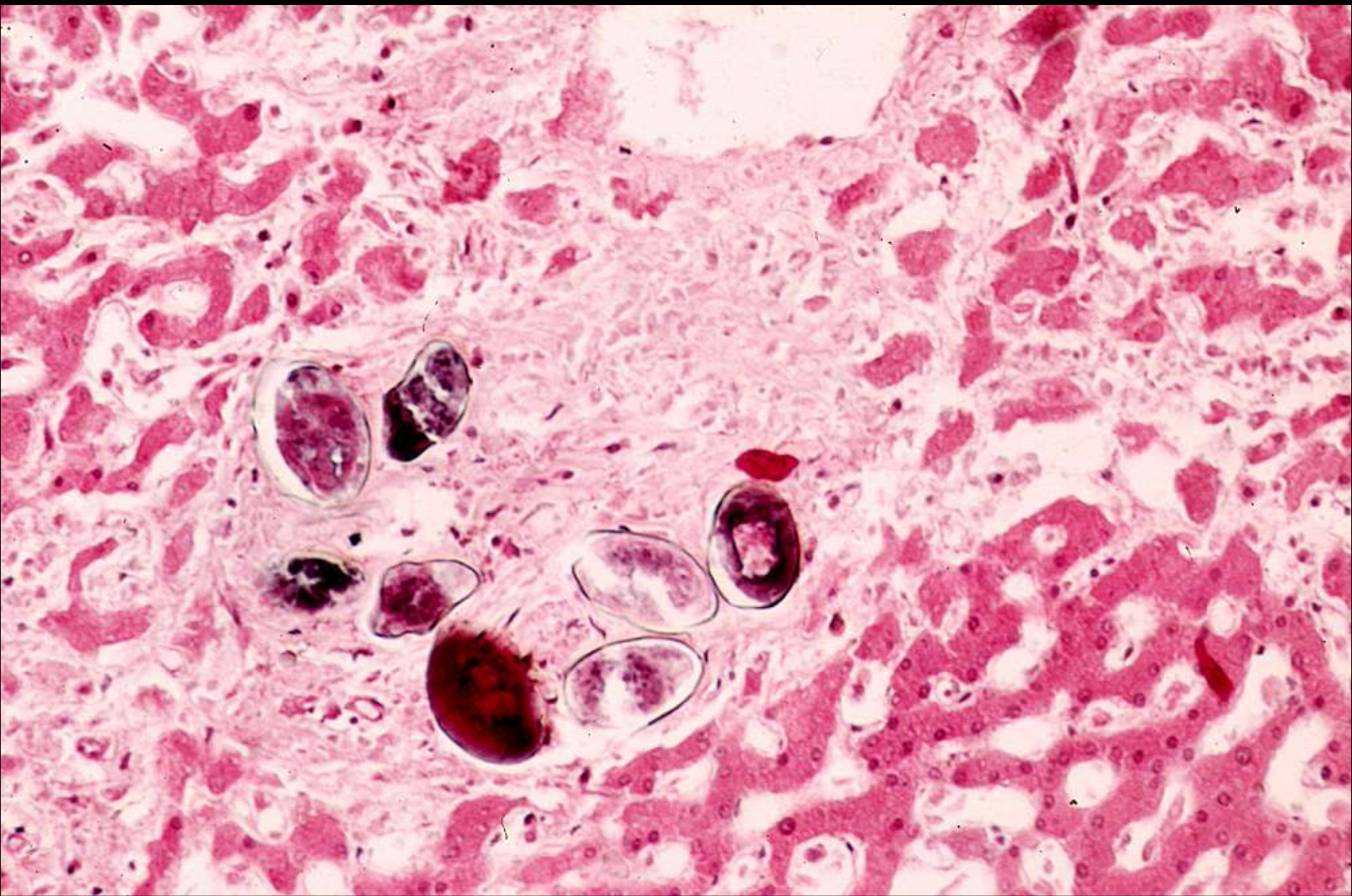
US man cerebral abscess

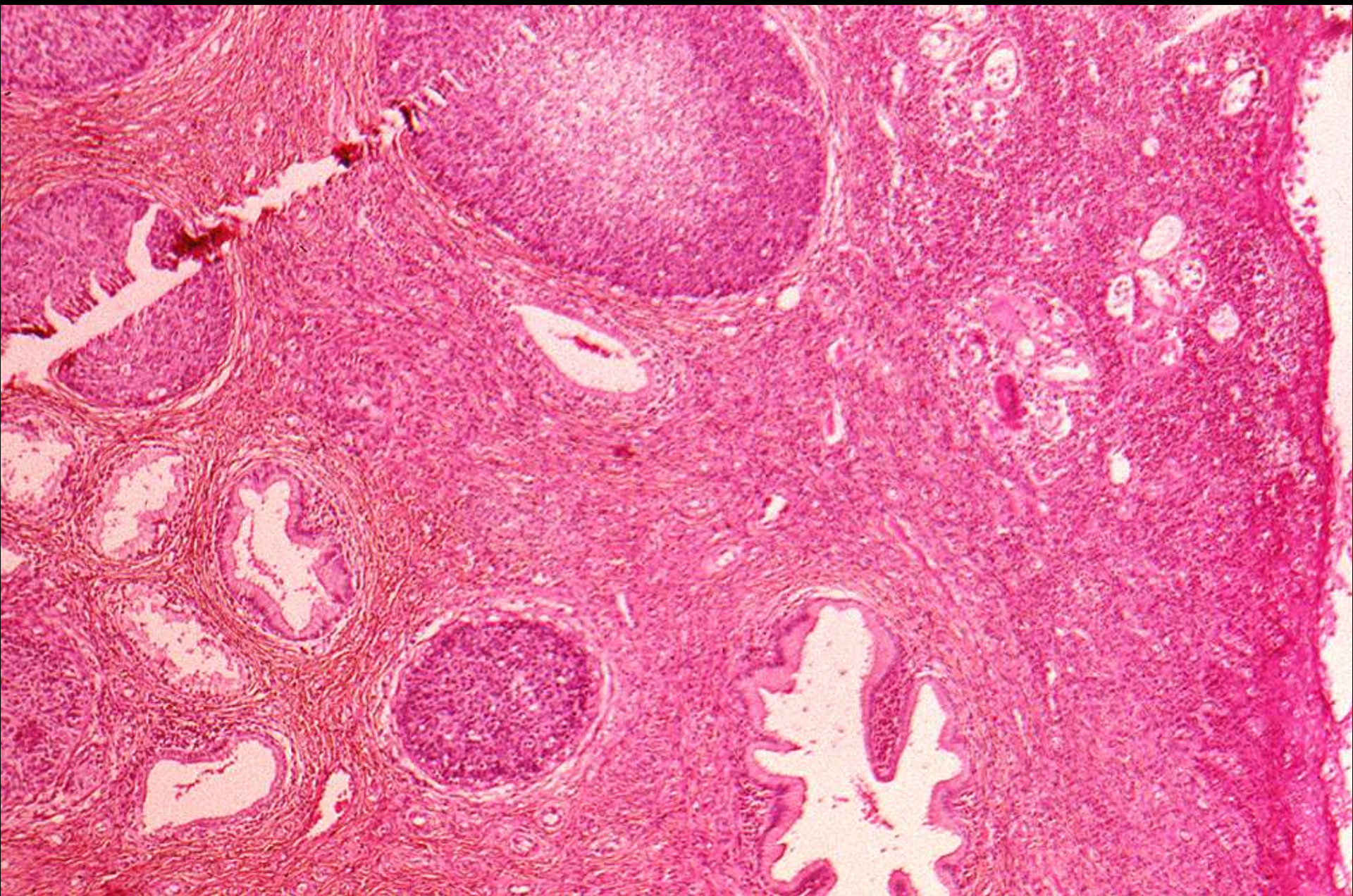
Local man cervical cord granuloma
with paraplegia.

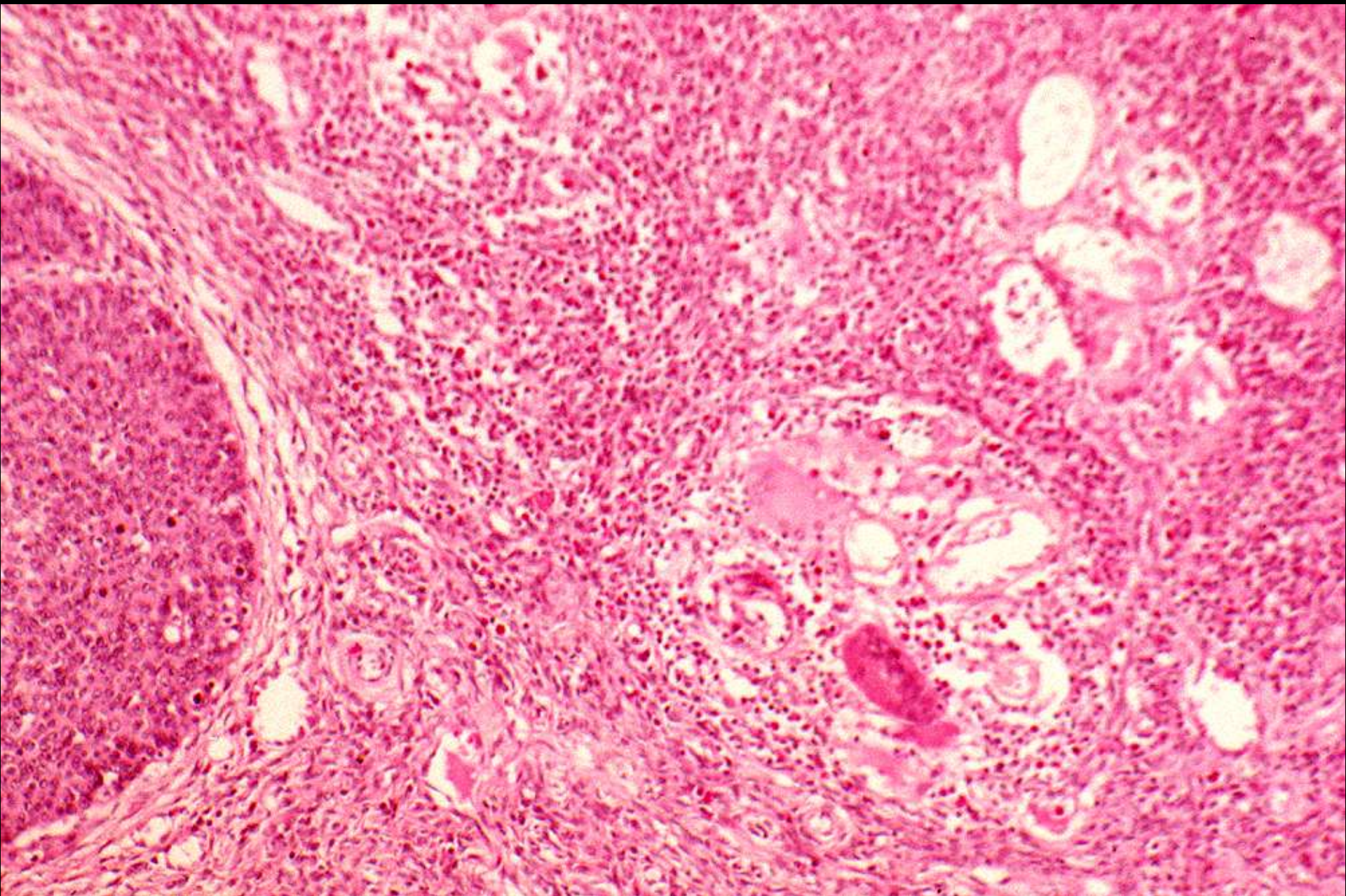
Football team and 'Lonely Planet.'

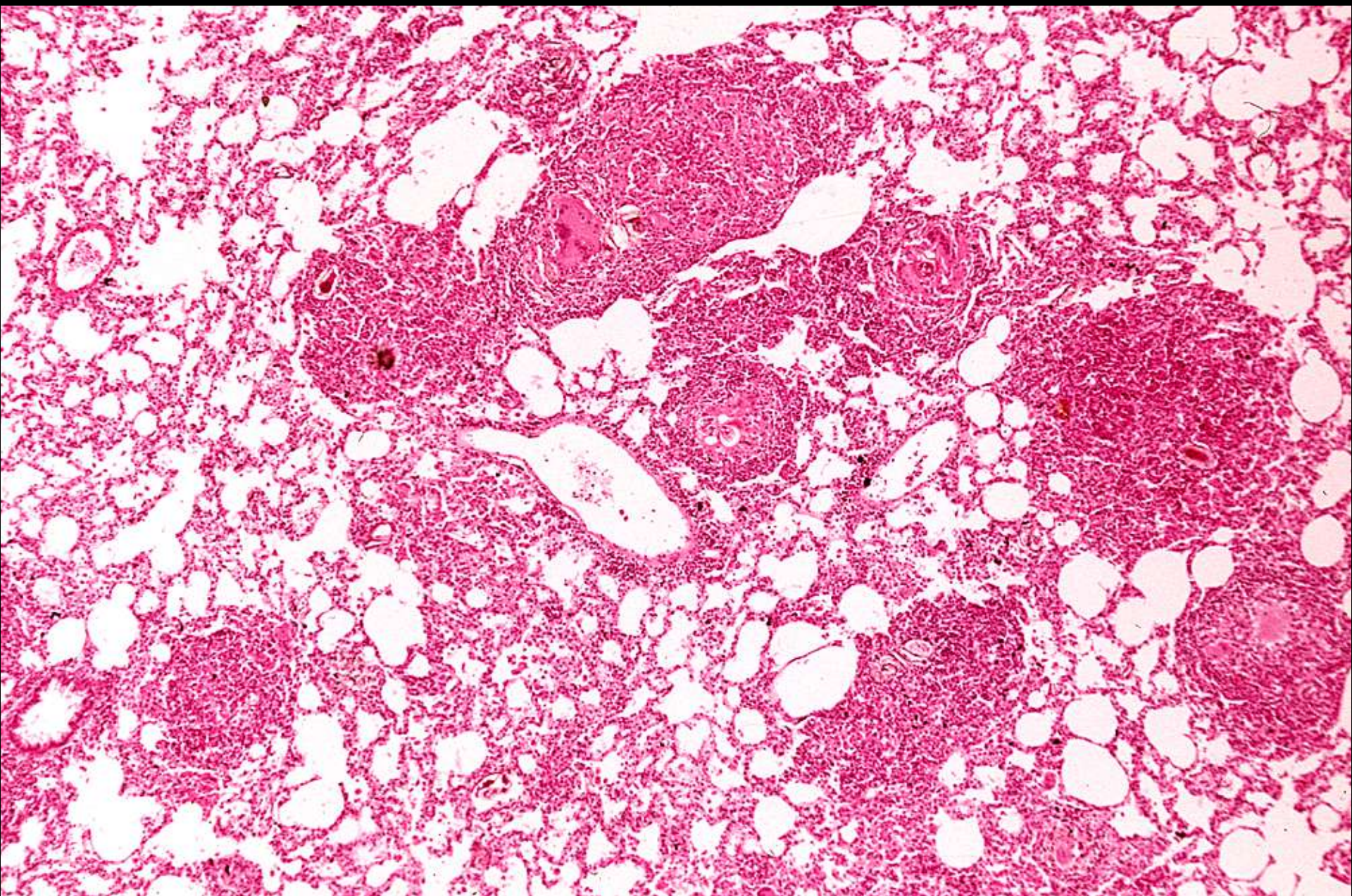
British tourist in Bolivia.

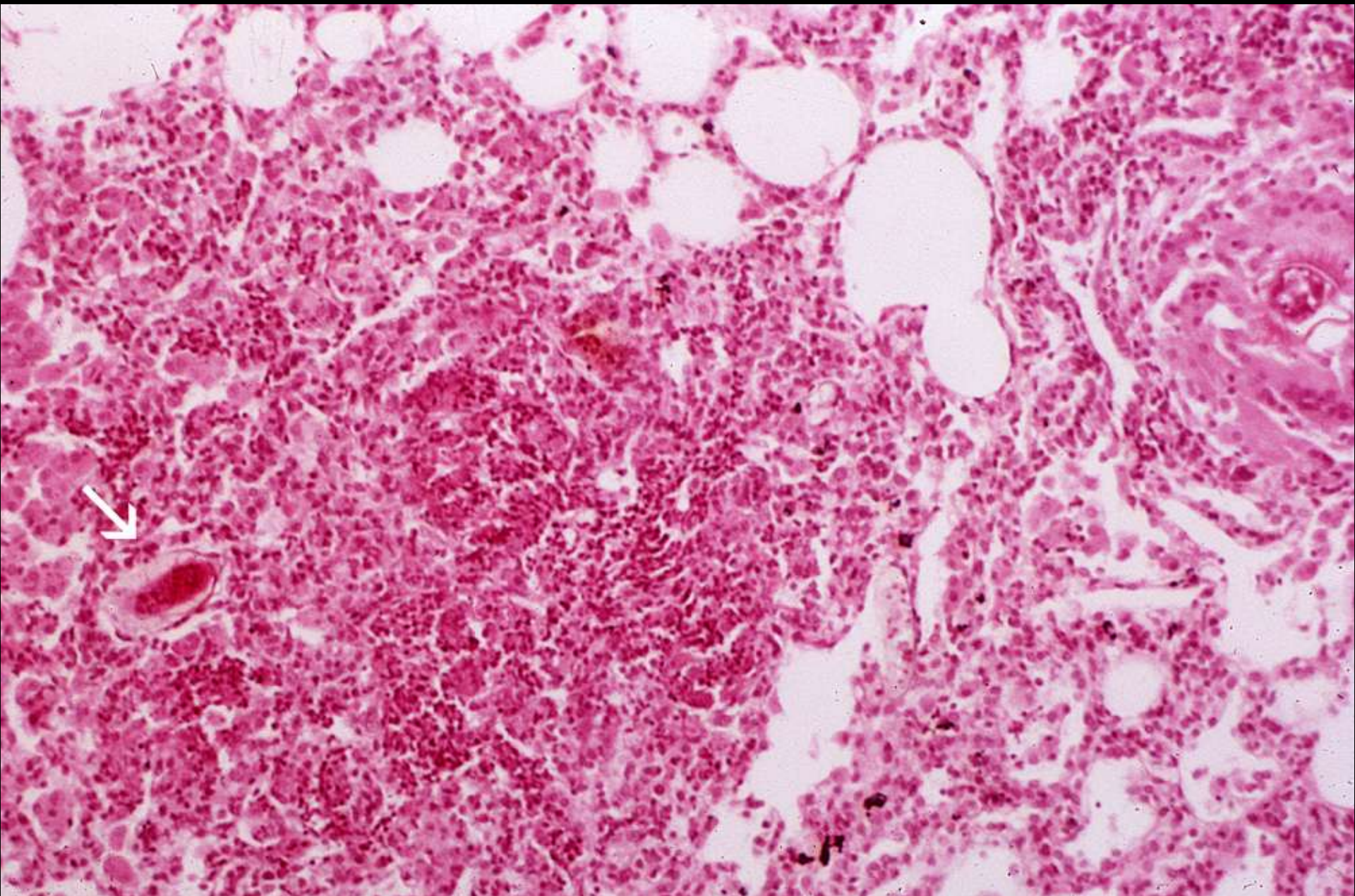


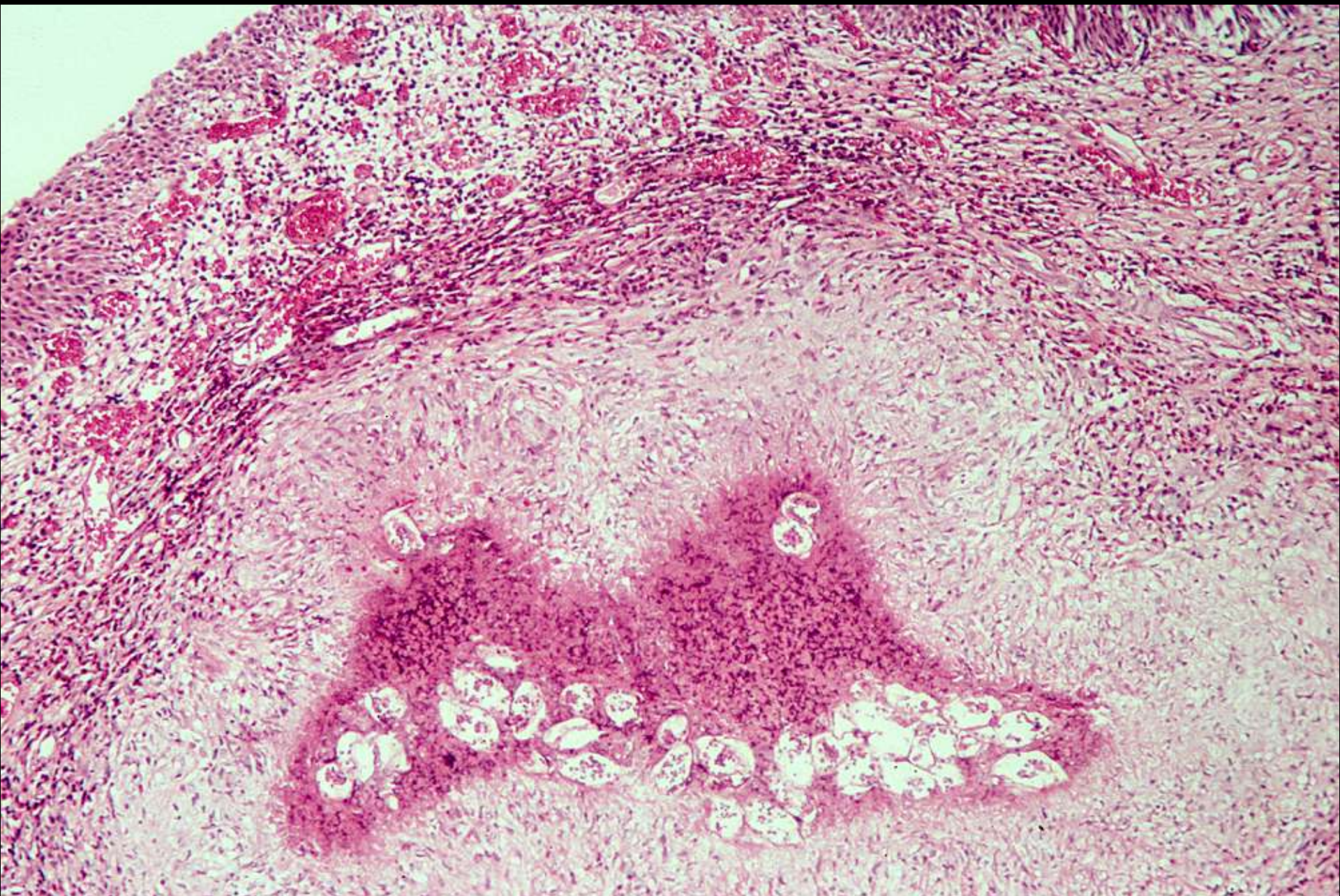


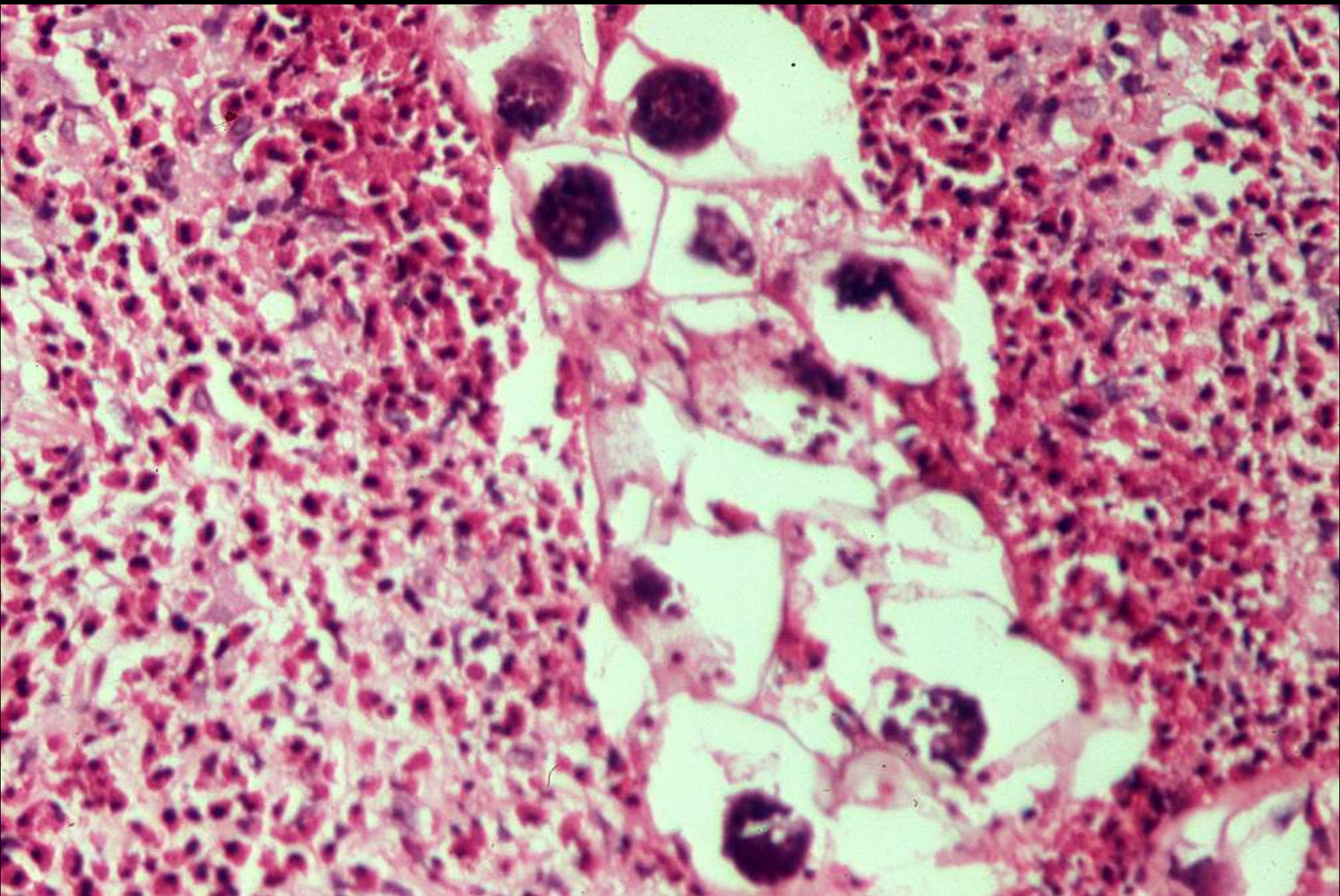


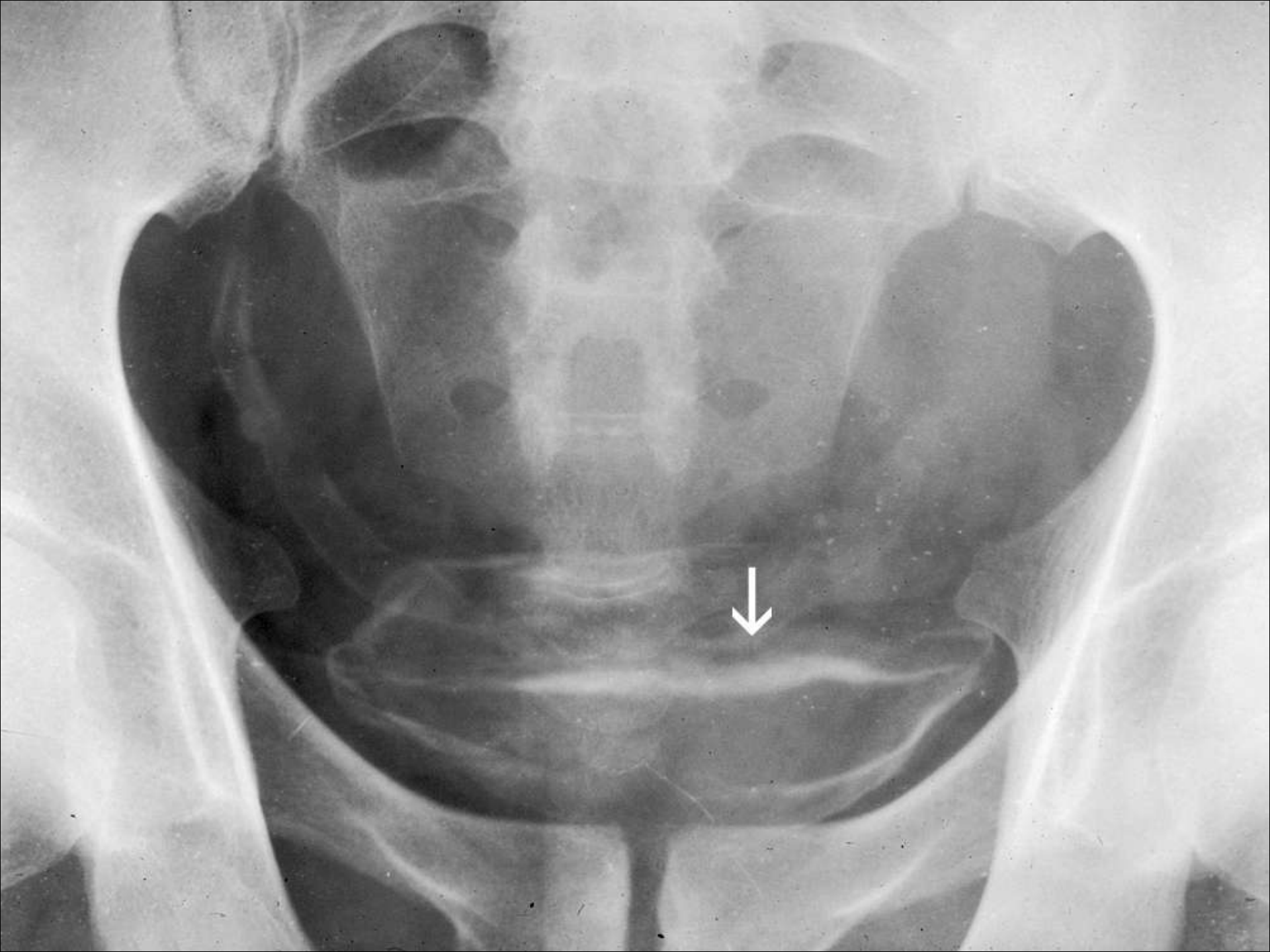




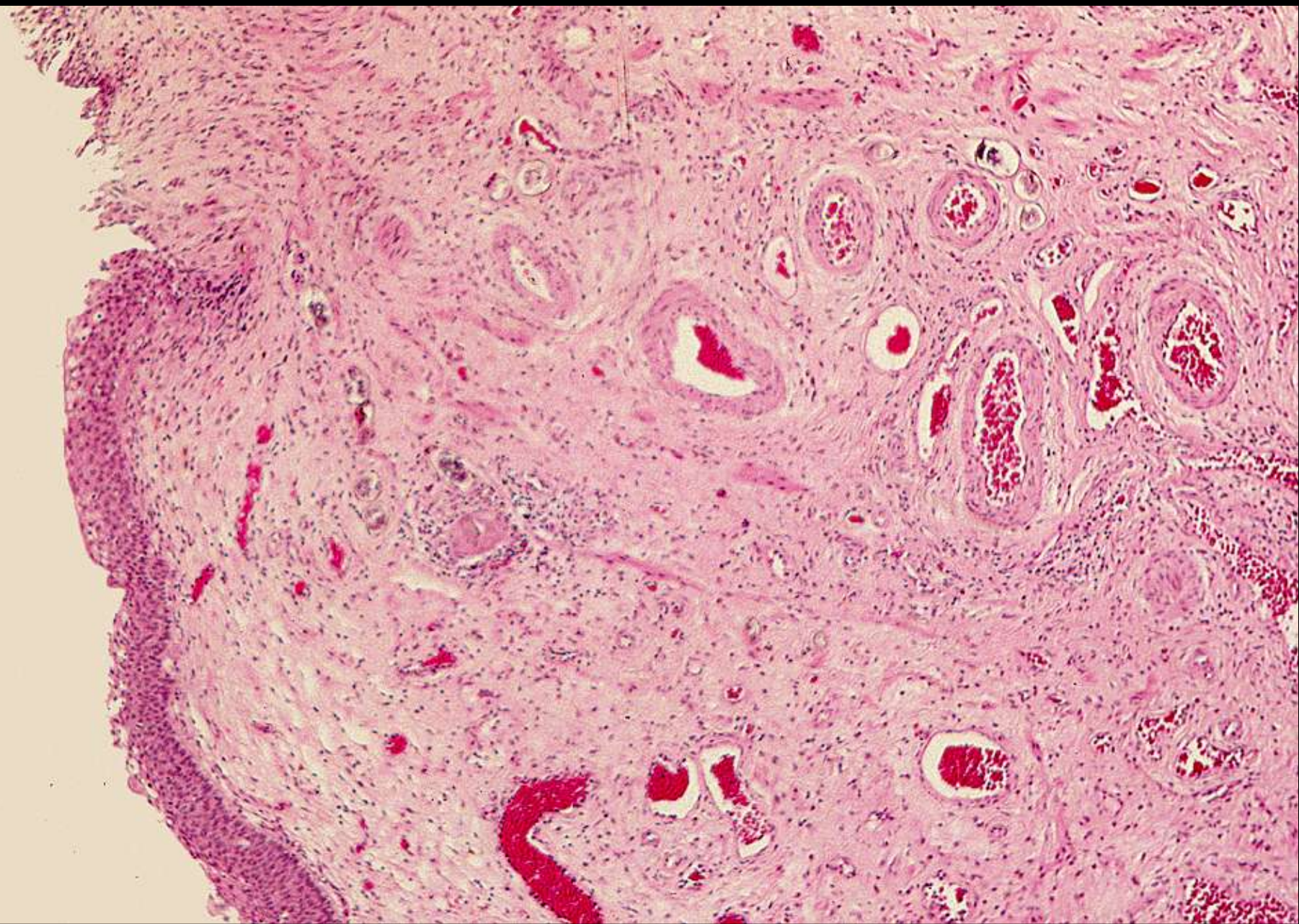


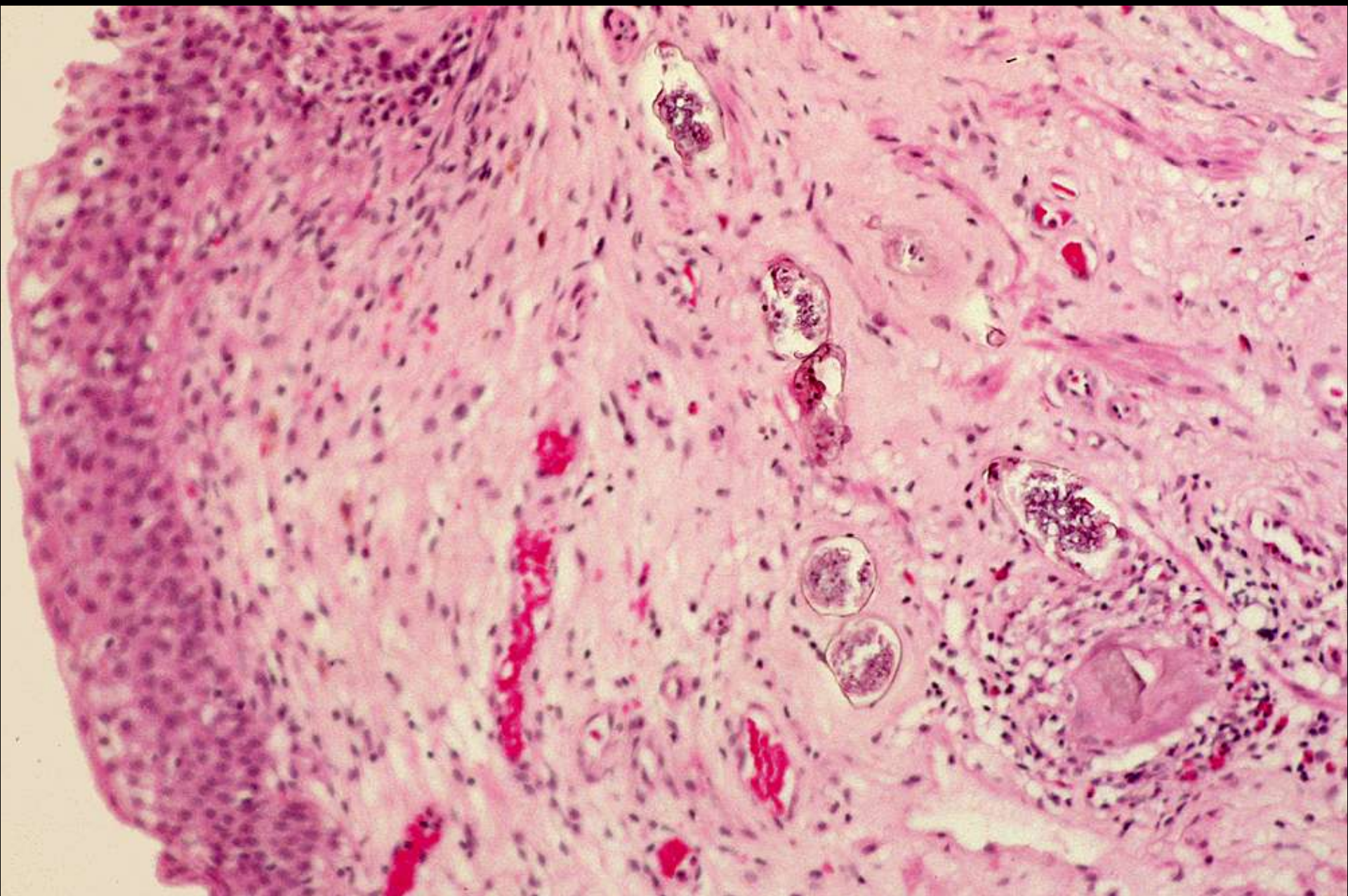


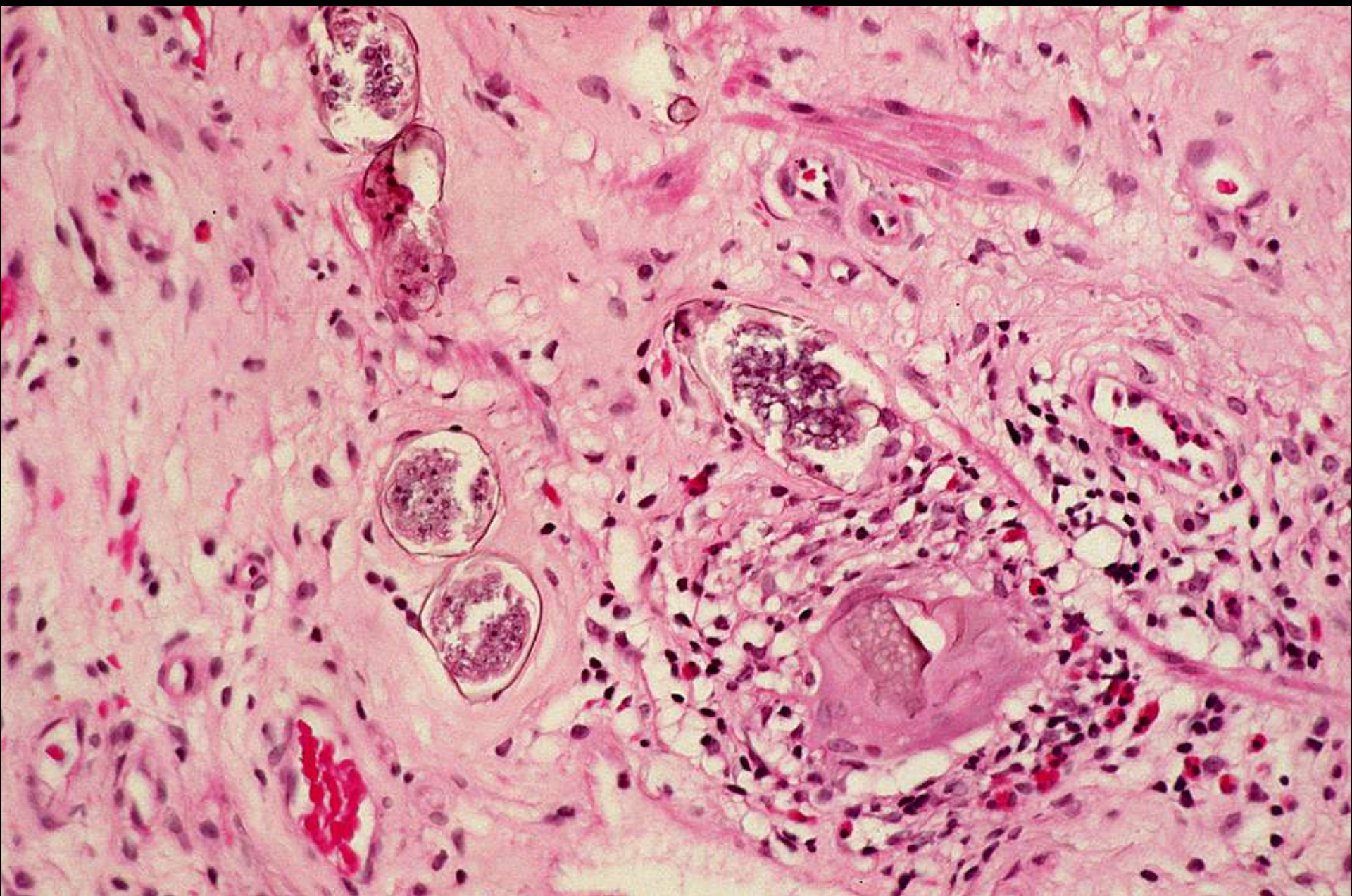








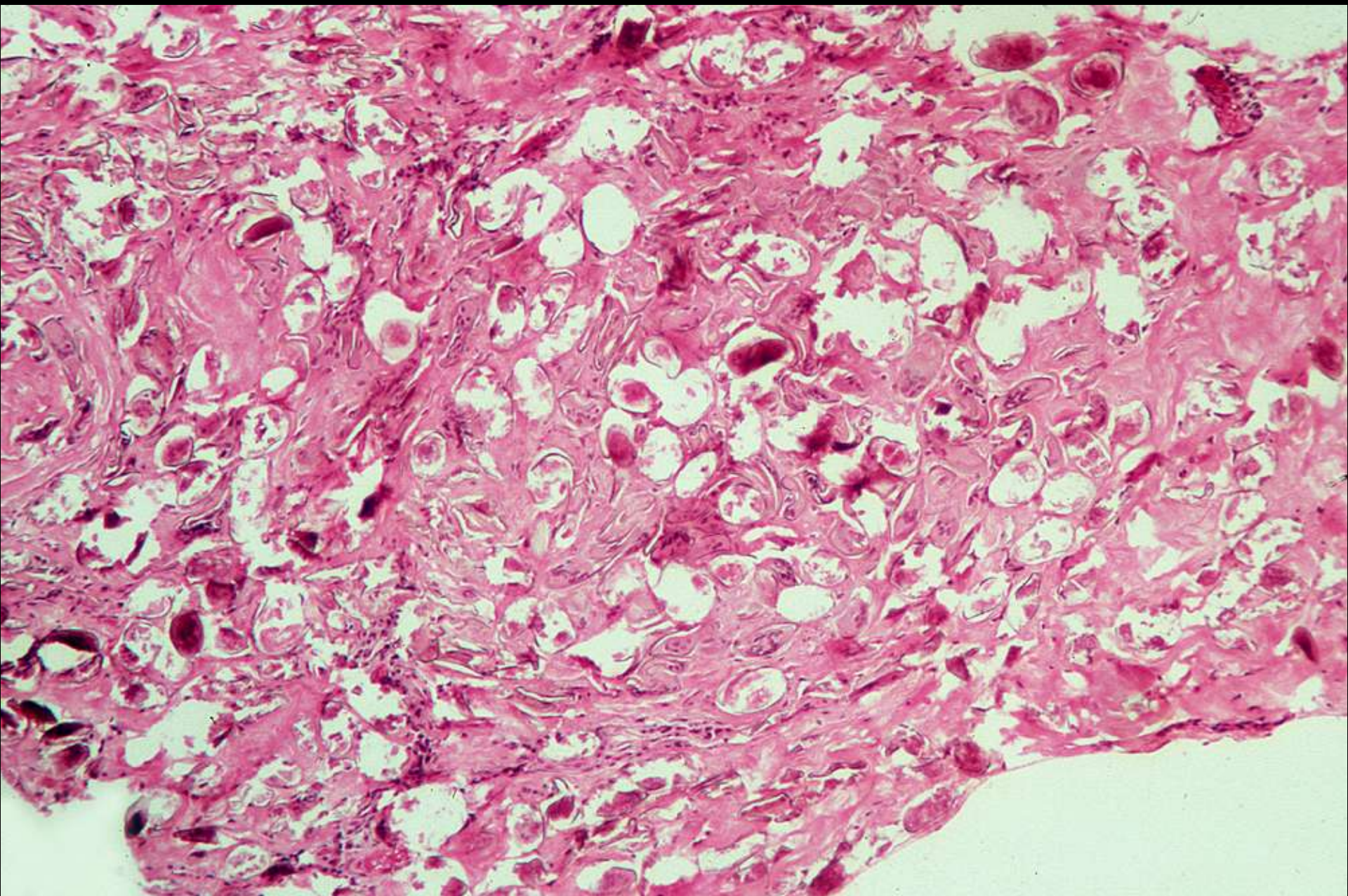


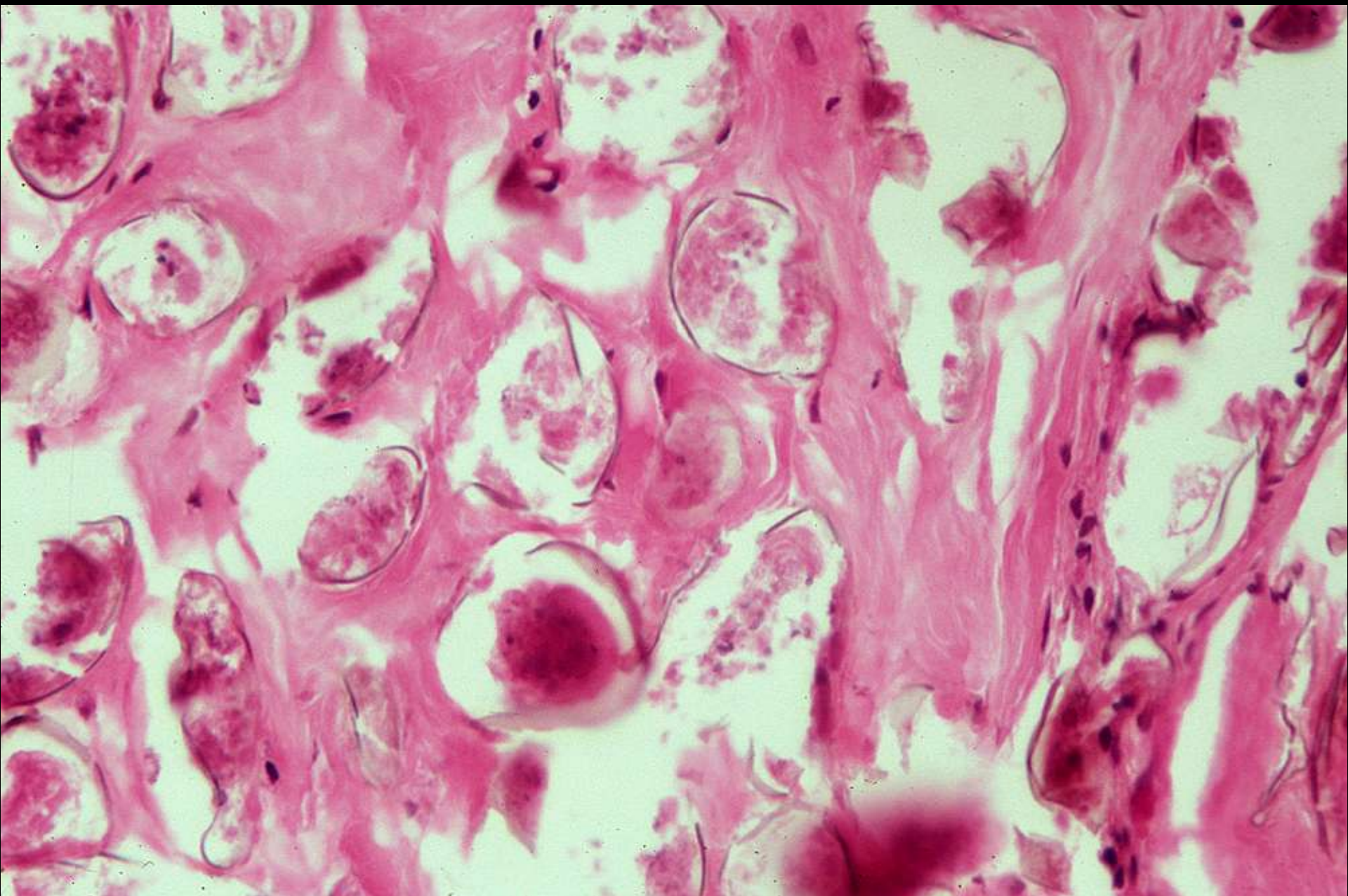


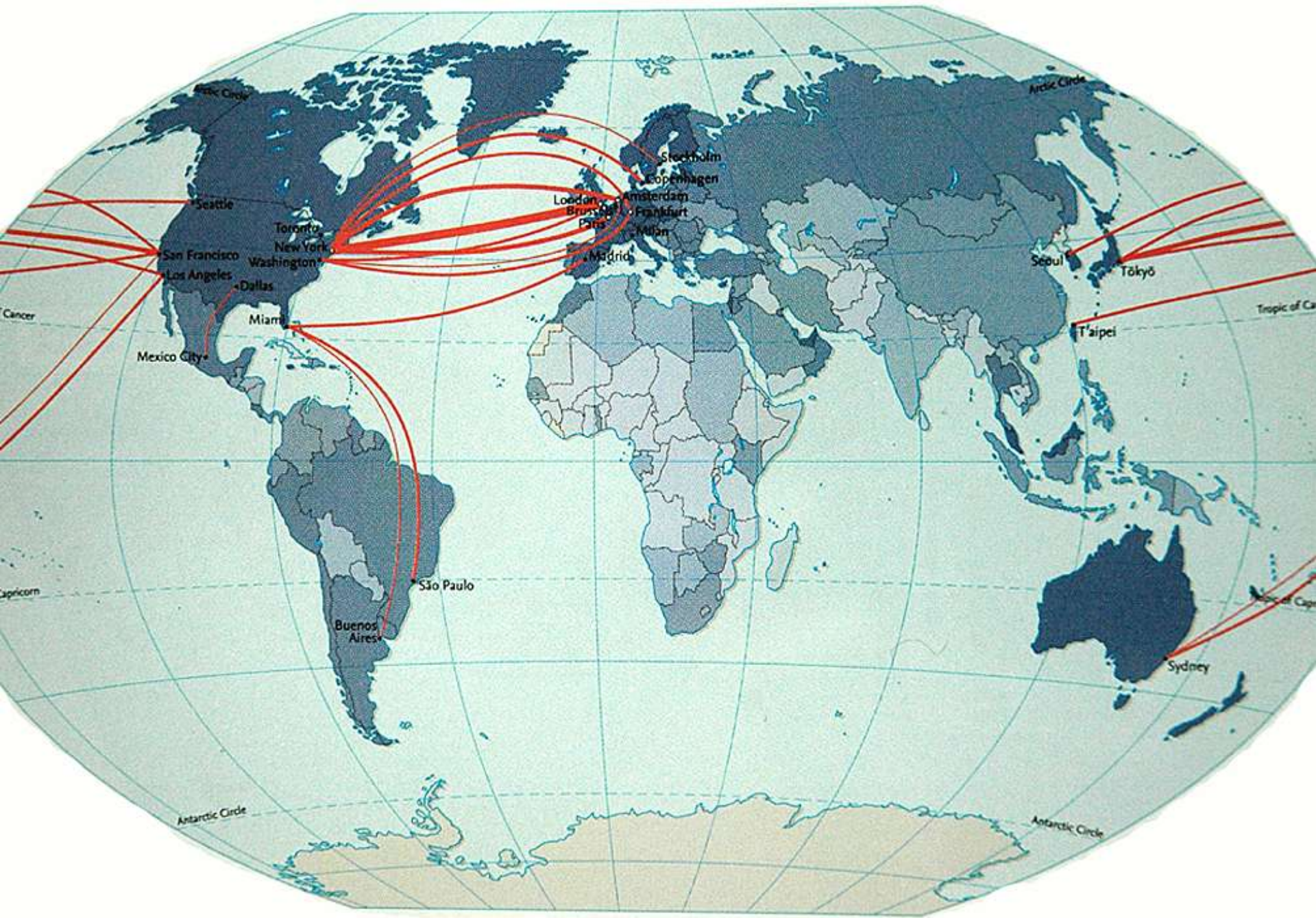
A 23 year old Filipino woman married to an Australian developed obstructed labour that had resulted from cephalo-pelvic disproportion.

During Caesarian section the surgeon noted some brown plaques on the serosal surface of the small intestine. He biopsied one of these.









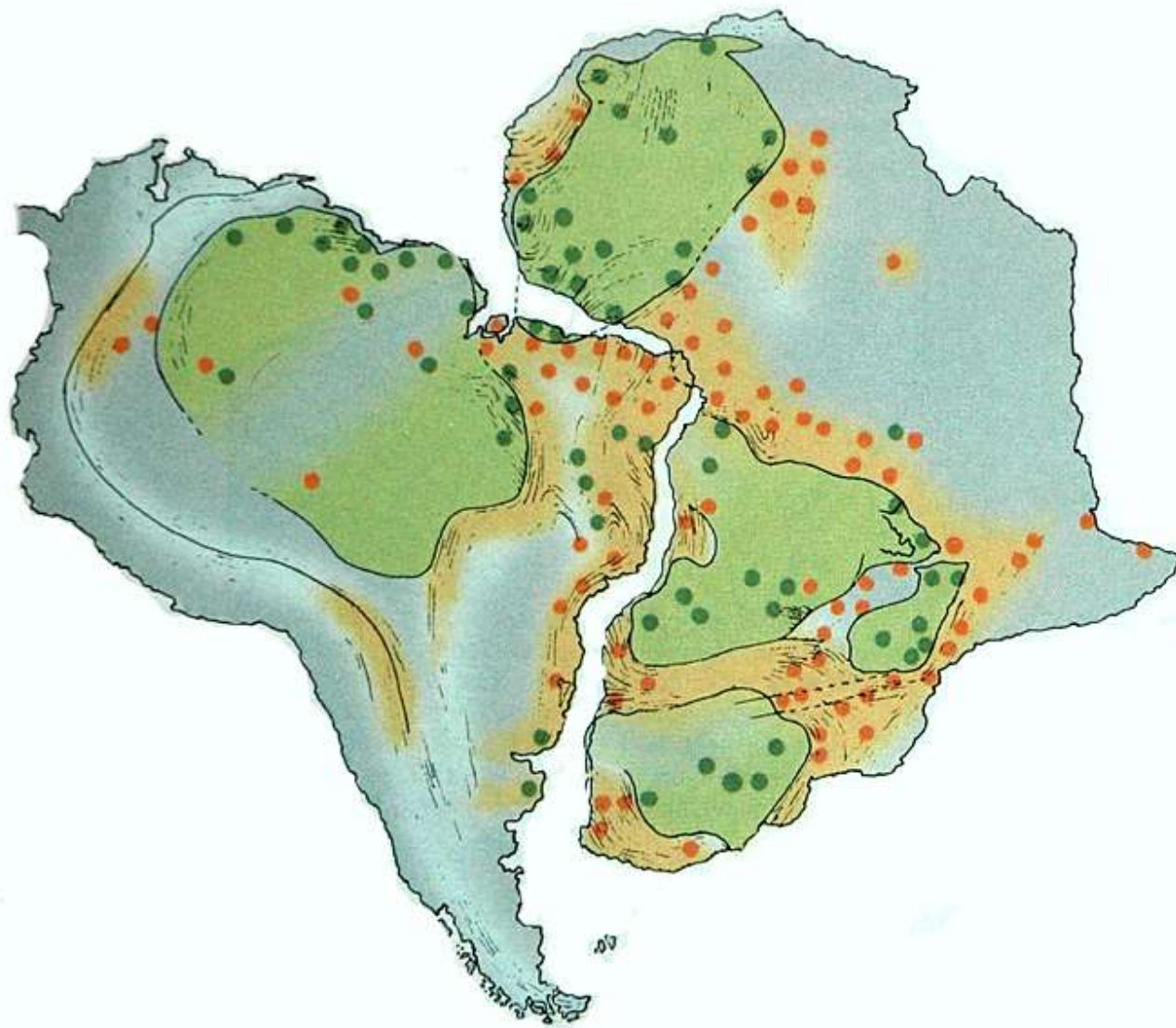


FIGURE 18.3

South America and Africa fit together, not only in outline, but in rock types and geological structure. The green areas represent the shields of metamorphic and igneous rocks formed at least 2 billion years ago. The orange areas represent younger rock, much of which has been deformed by mountain building. Structural trends such as fold axes are shown by dashed lines. Most of the deformation occurred from 450 million to 650 million years ago. Several fragments of the African shield are stranded along the coast of Brazil. Green dots represent rocks that are more than 2 billion years old. Orange dots represent younger Proterozoic and Cambrian rocks.

Sting's green appeal

STING, rock star turned rainforest crusader, said yesterday "I'd love to get arrested" in Australia over a conservation issue.

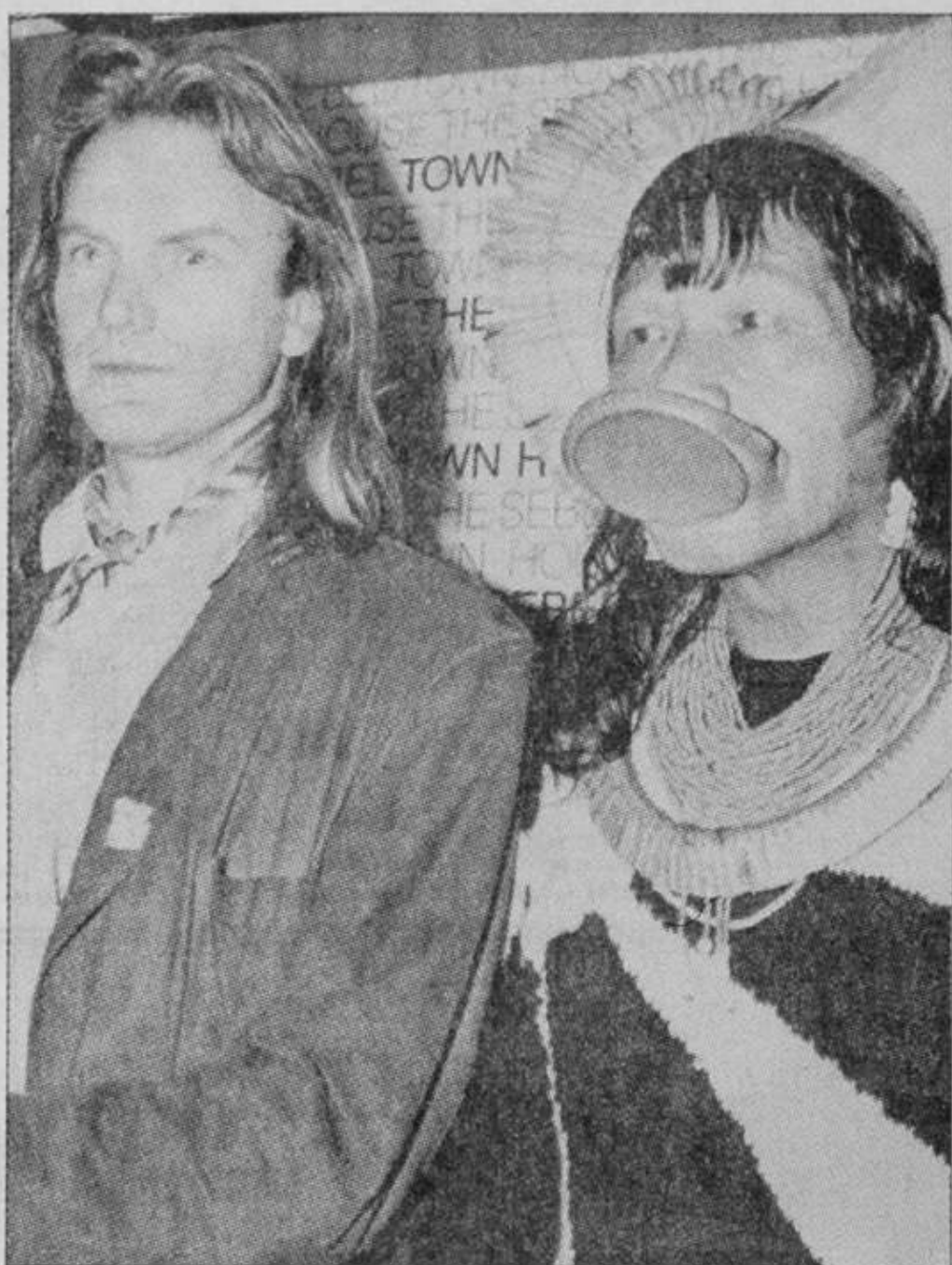
The English singer is in Australia as part of his global campaign to save the Brazilian rainforests.

Sting will meet Prime Minister Hawke and federal Environment Minister Richardson on Tuesday to discuss conservation issues.

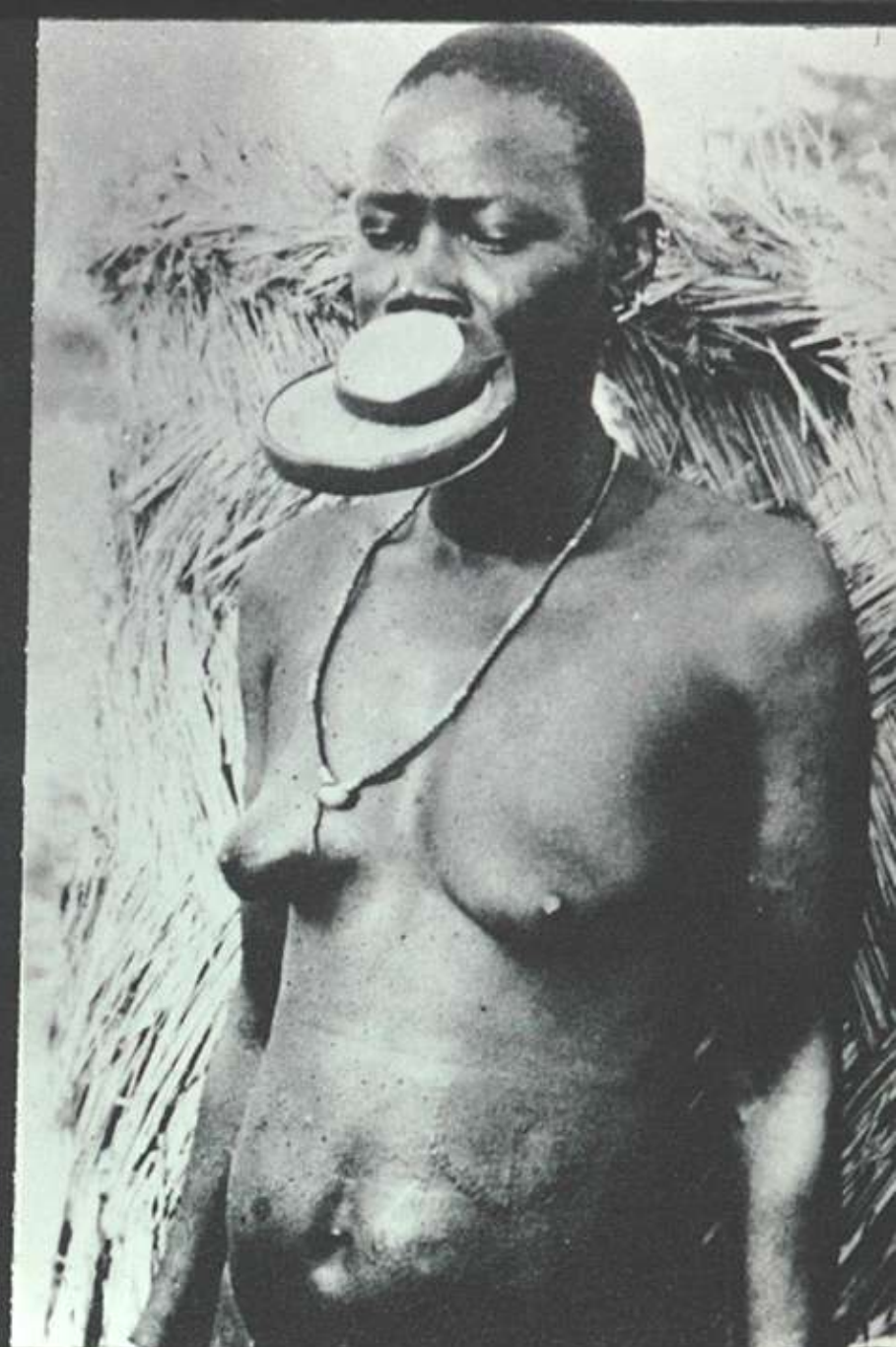
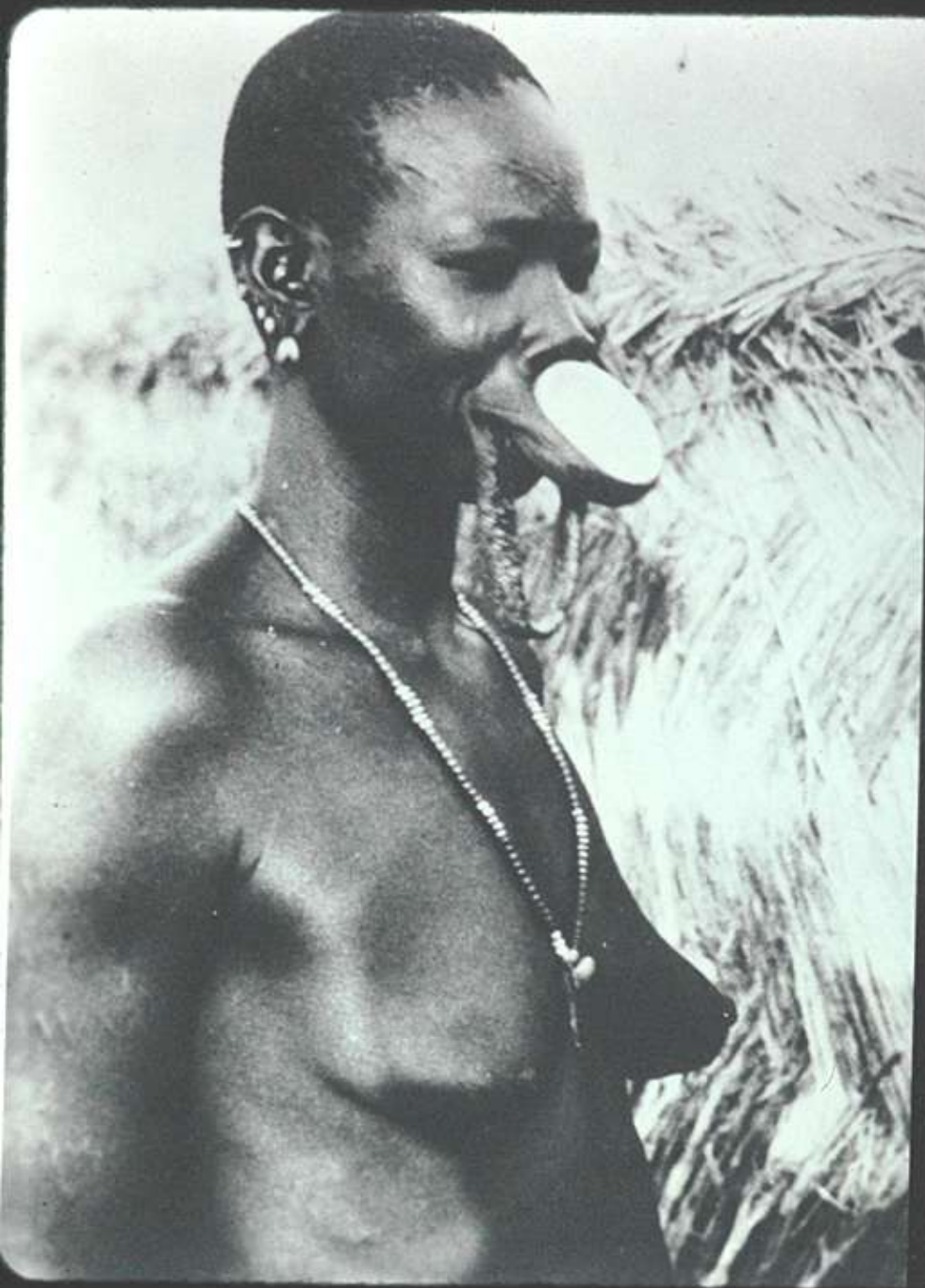
Sting appealed to the people yesterday to save Australian rainforests and the Amazonian rainforests in Brazil.

He said he would visit conservationists at Eden in the south-east forests of NSW on Tuesday before flying to Canberra.

Australia is the last stop on a tour which has taken Sting and his travelling companions — Amazon Indians Raoni and Megaron, North American Indian Red Cloud and Belgian filmmaker Jean-Pierre Dutilleul — to 17 nations.



Sting ... "I'd love to get arrested ..." in Sydney yesterday with Amazon Indian Chief Raoni



Schistosomes—other than *S. japonicum*

Infected humans.



Adult worms in rectal and vesical venous plexuses.



Eggs penetrate the bladder wall and are passed in urine.



Urination into shallow water.



Ciliated miracidia hatch and enter the fleshy part of a snail.



Cercariae develop, and enter the water.



Cercariae penetrate the skin of uninfected humans.

Schistosomes—*S. japonicum*

Adult worms in rectal and vesical venous plexuses of infected humans and some reservoir animals.



Eggs passed in feces. If feces are passed into water, ciliated miracidia emerge from the eggs and enter a snail.



Cercariae develop and enter the water.

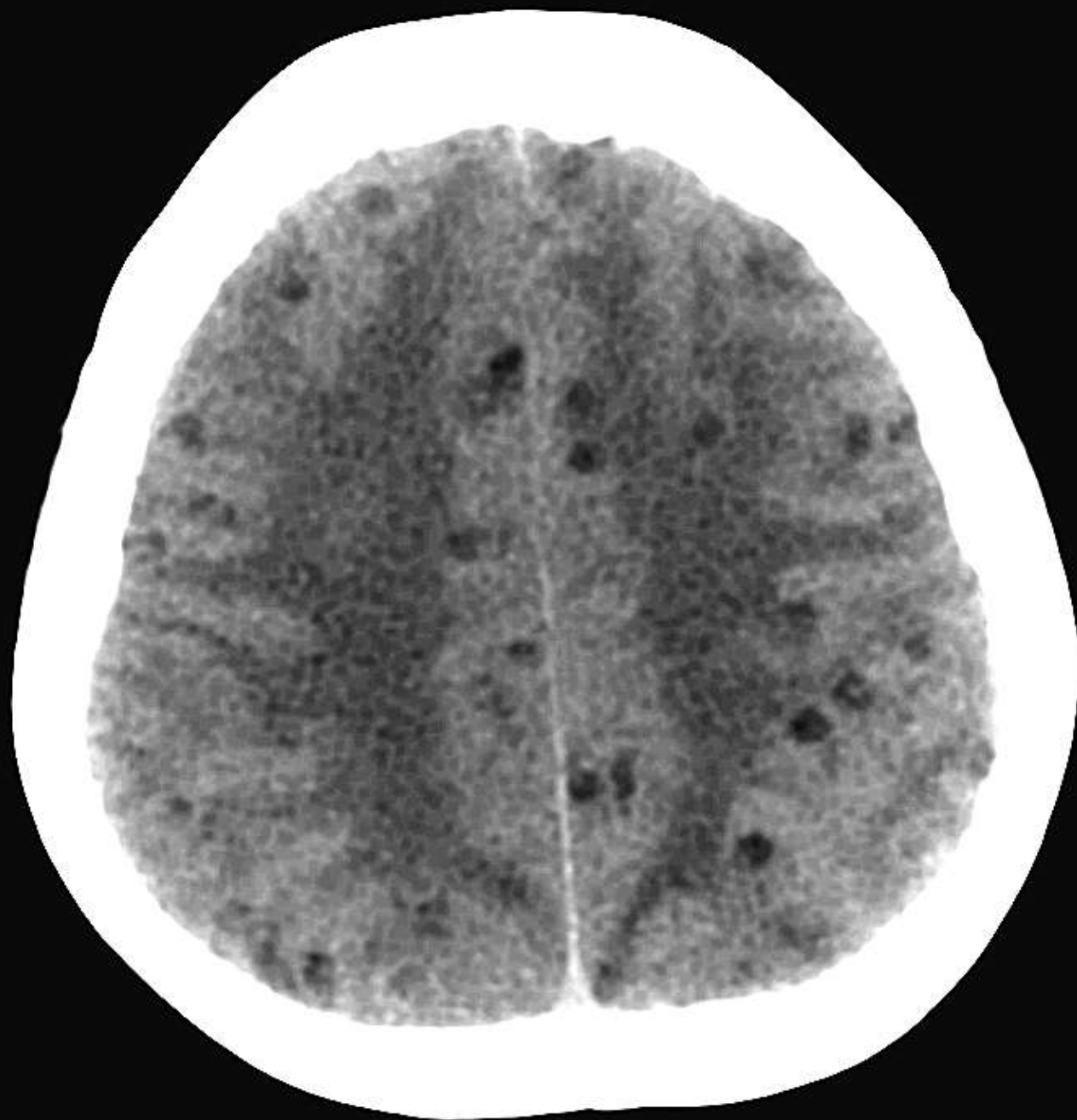


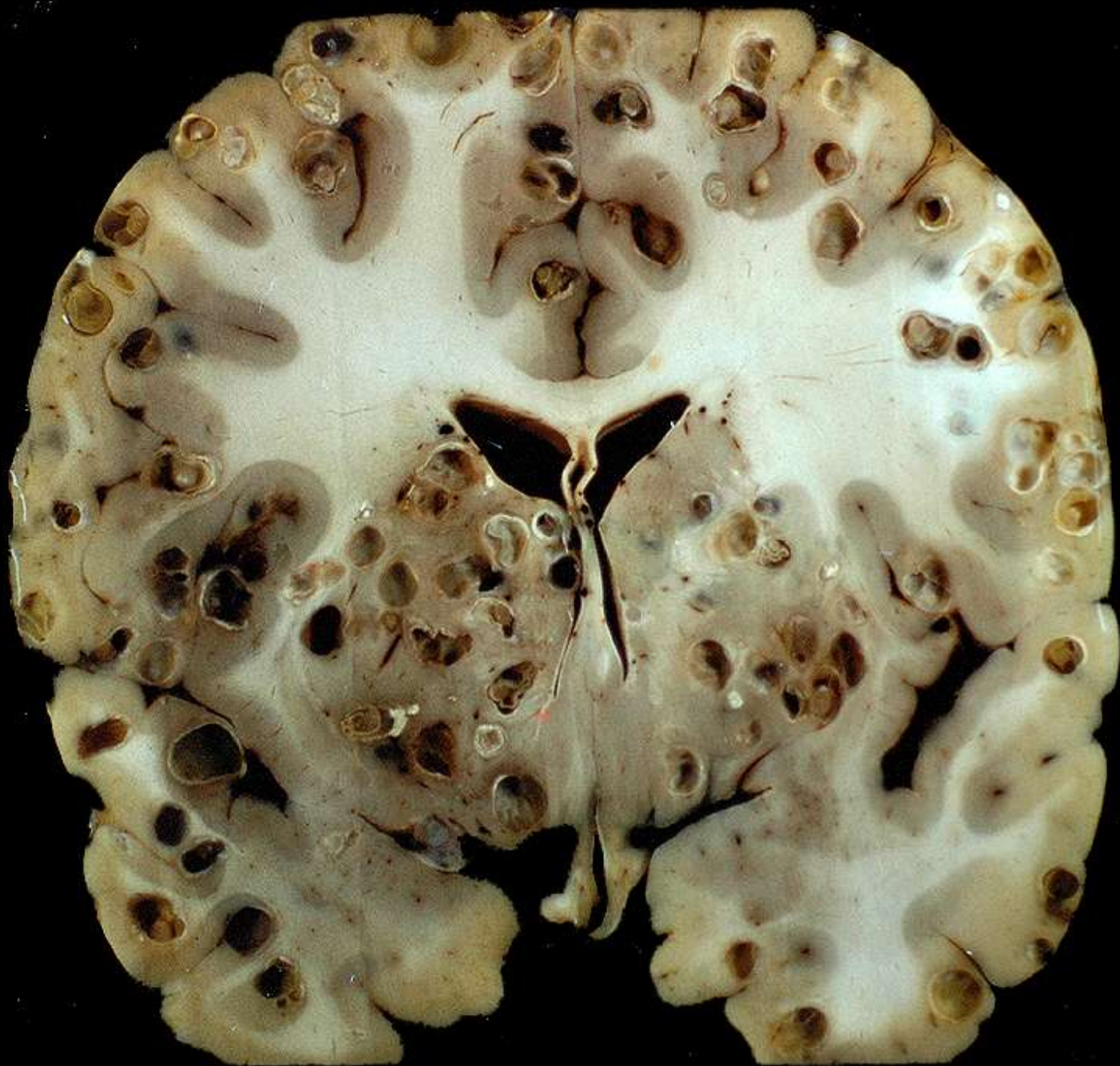
Cercariae penetrate the skin of uninfected humans.

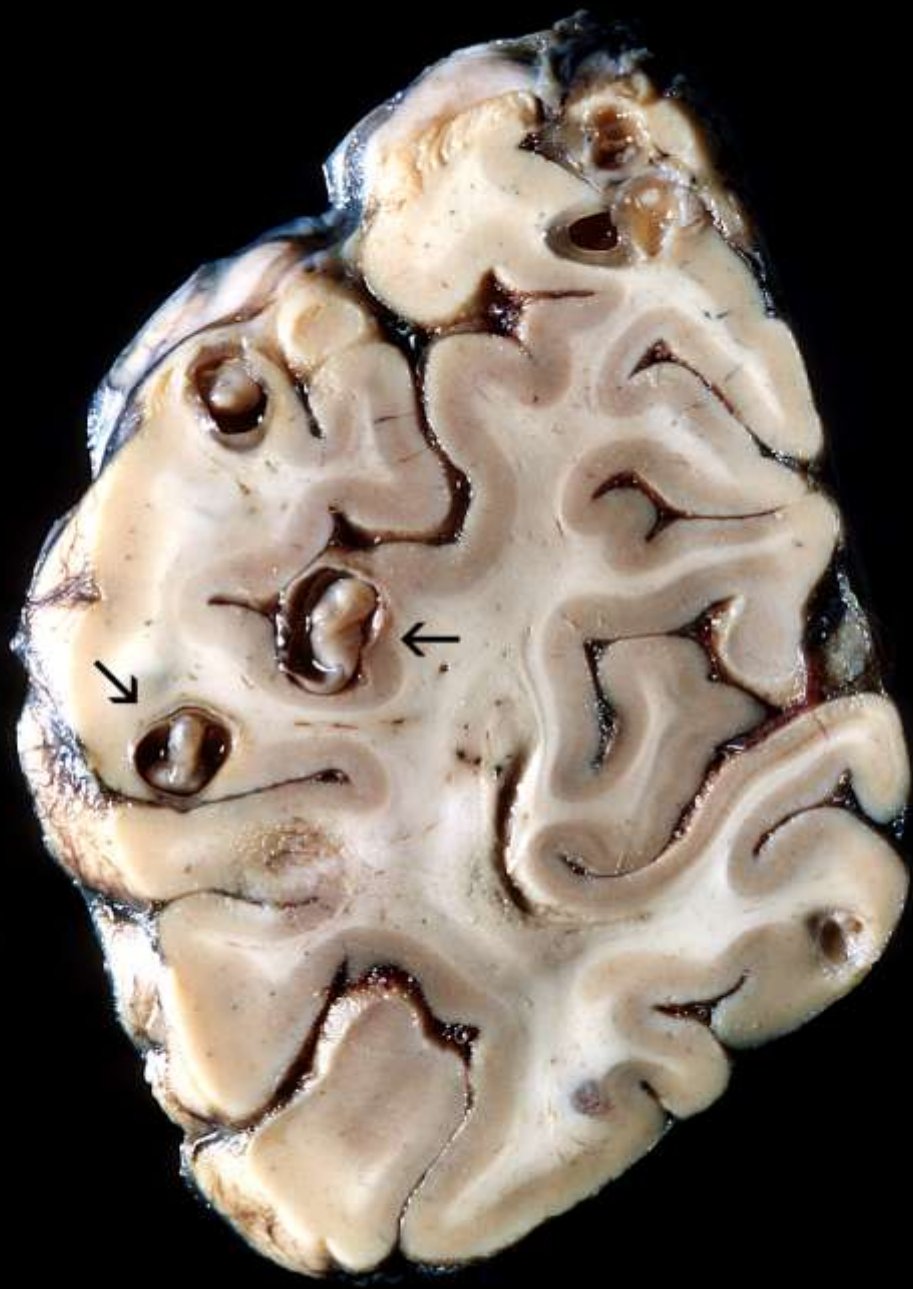
Cysticercosis

A female 29, an immigrant from Laos to Australia in January 2007 presented in July, 2007 complaining of headache, diplopia and fits.

CT of brain showed multiple cysticerci throughout the brain.

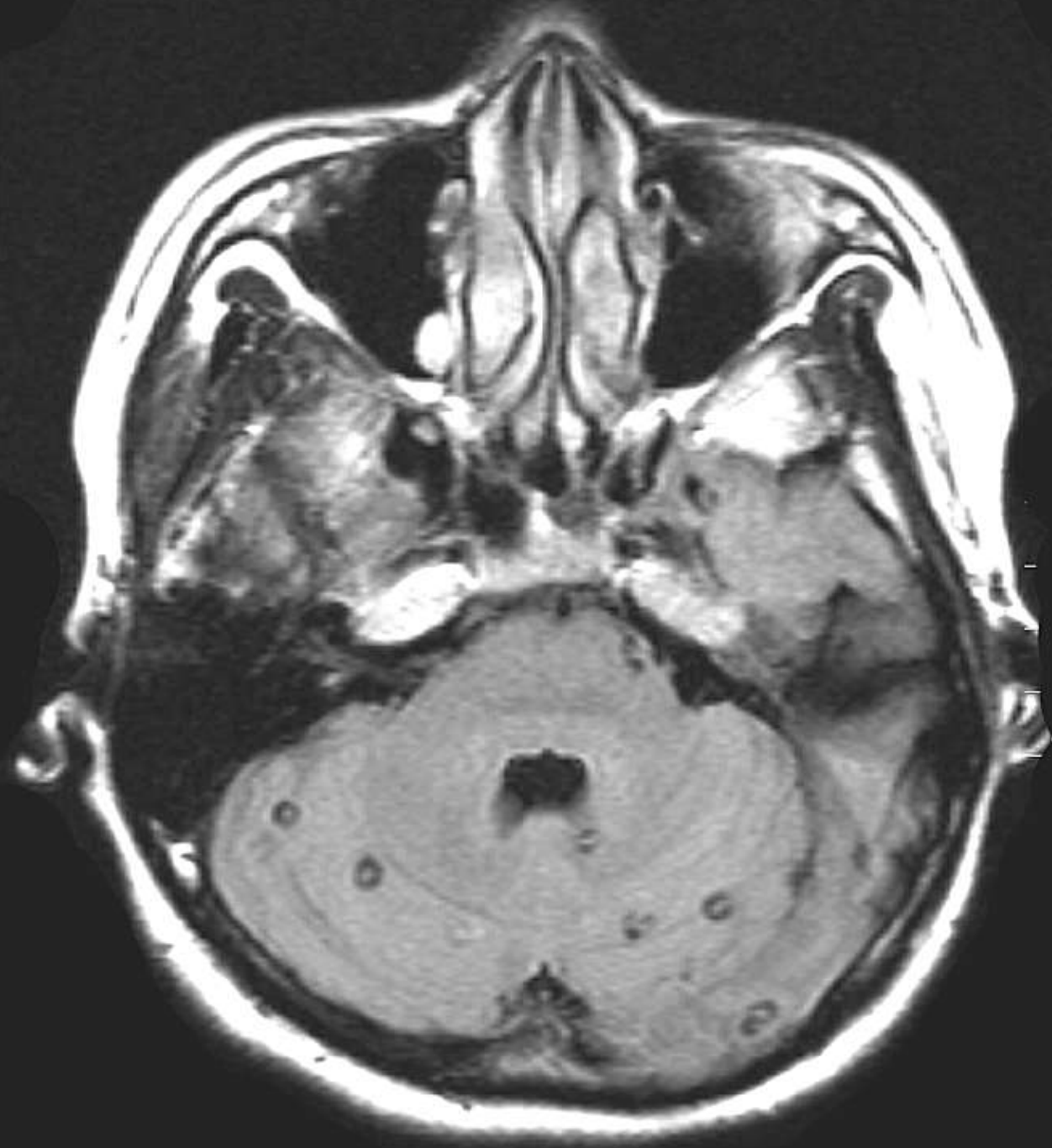


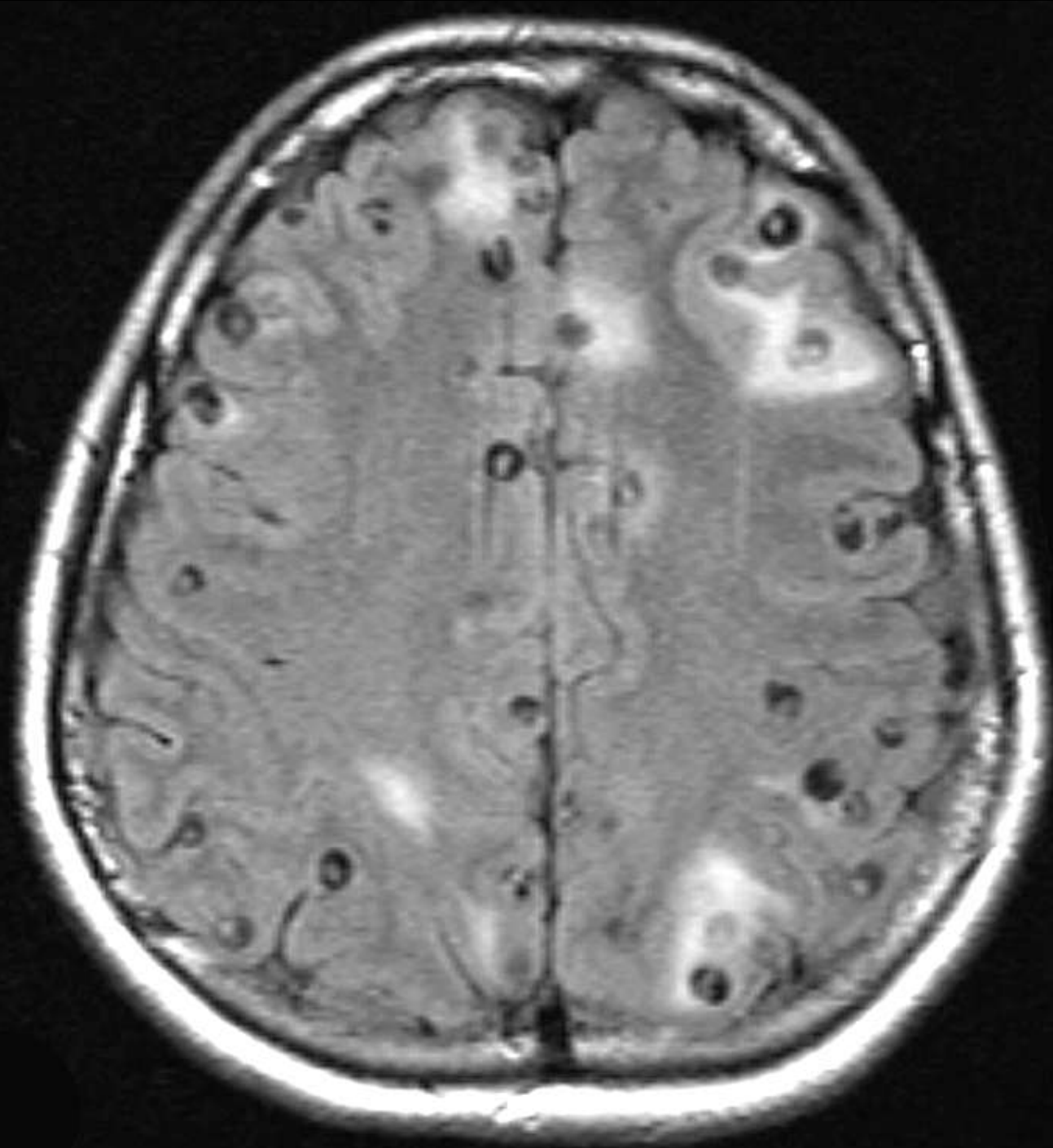


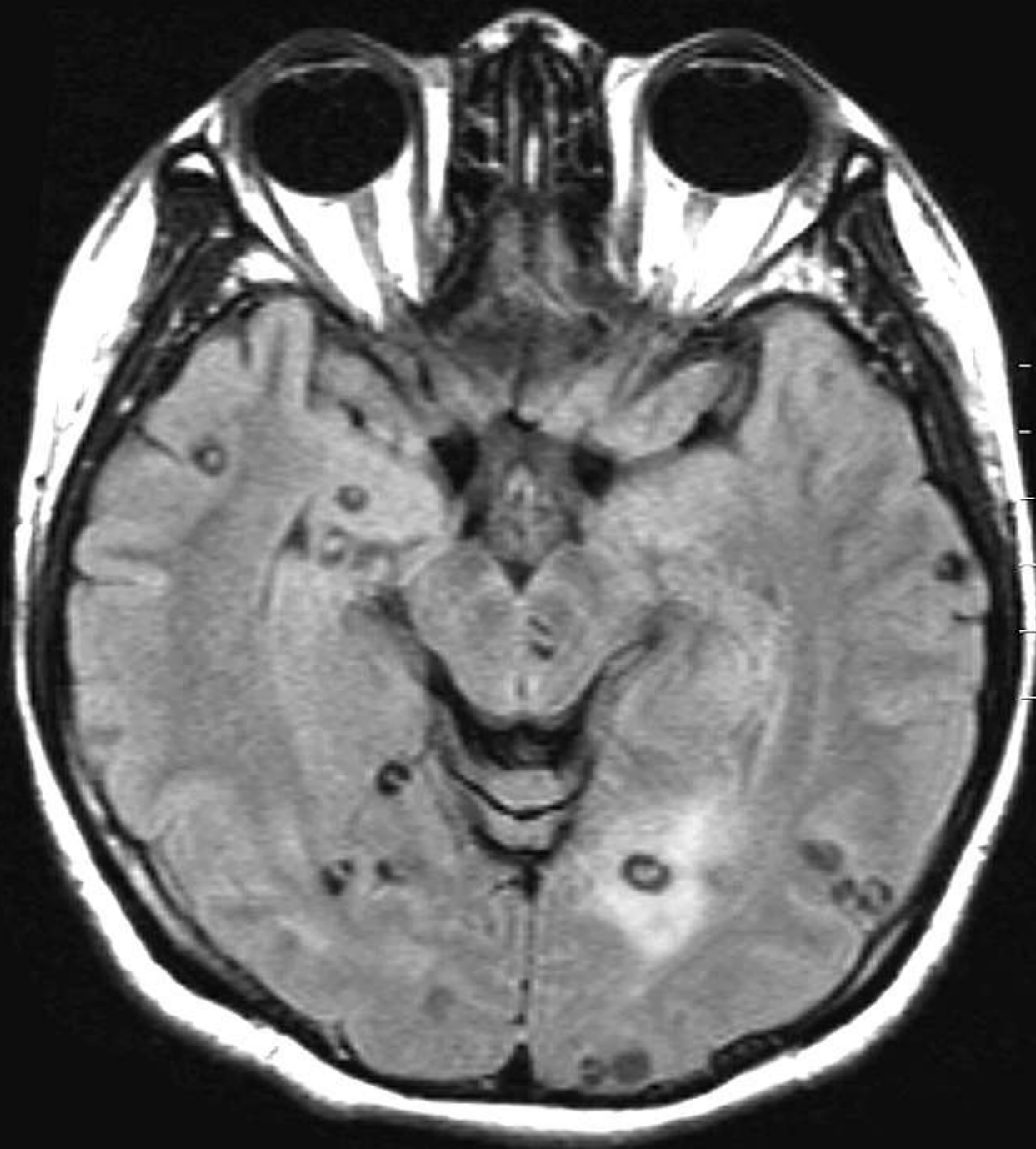


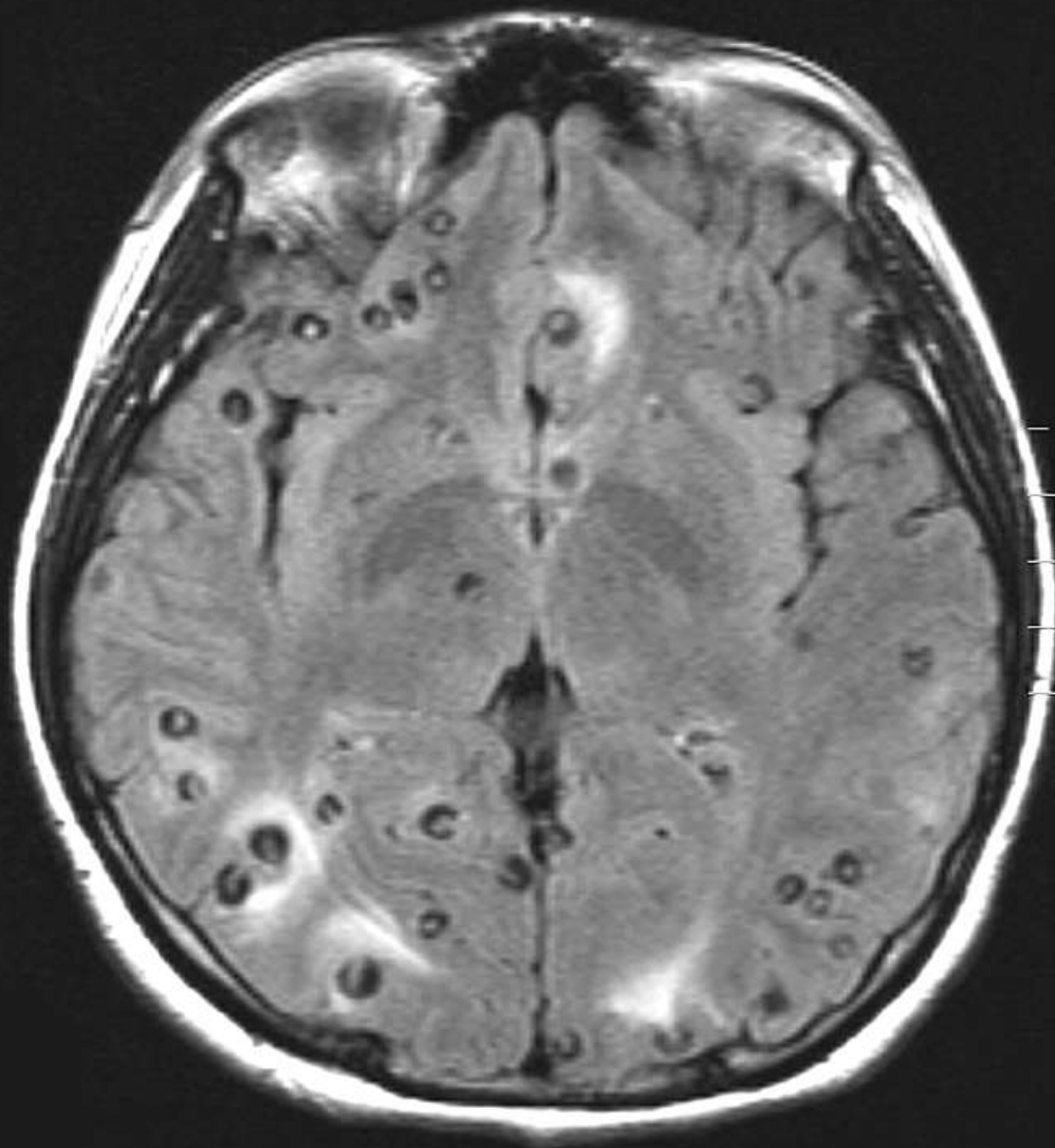




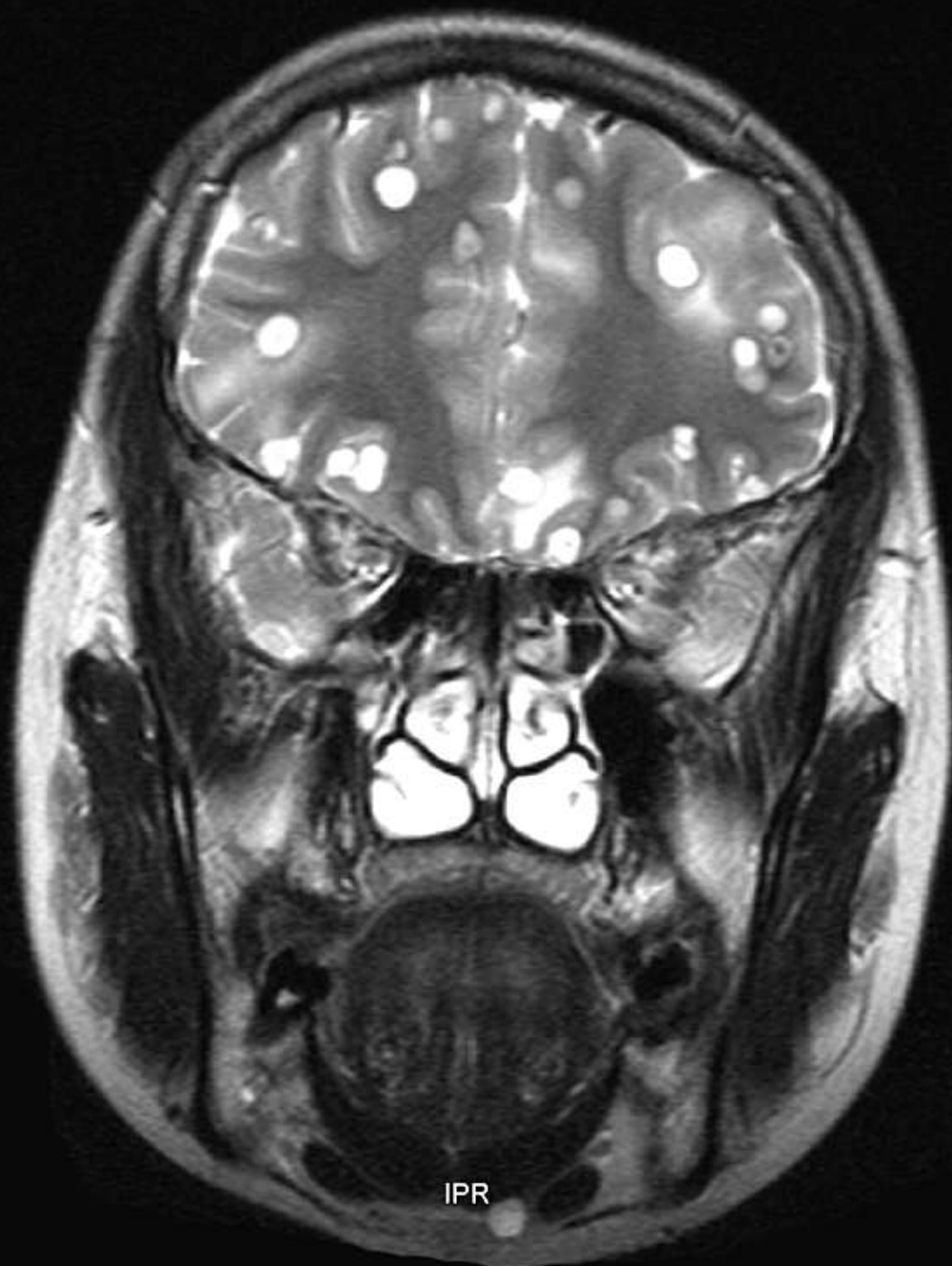




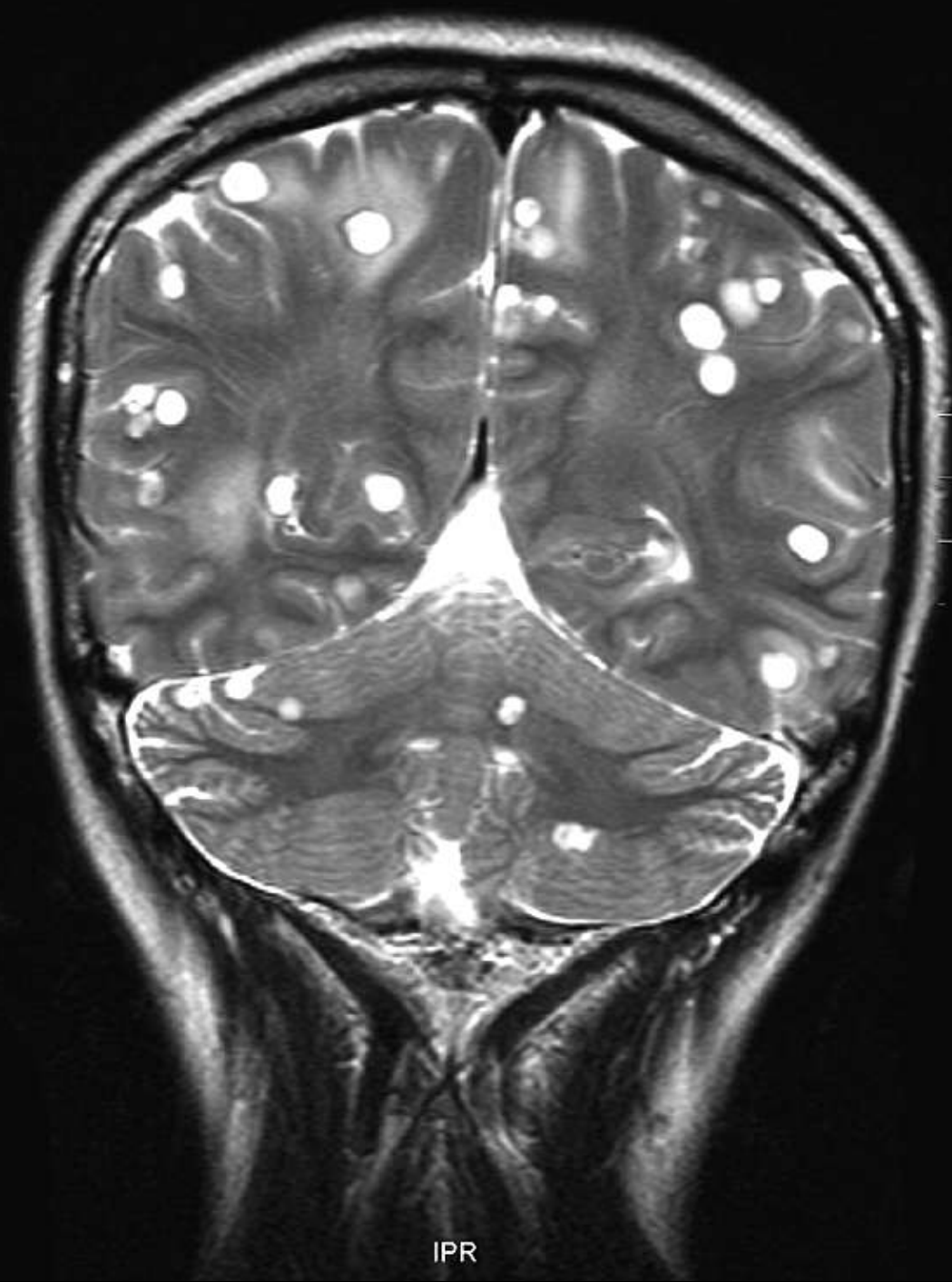




In July 2008 after one course of treatment many of the cysticerci have calcified.



IPR



In Sept 2009 she presented to have a cysticercus removed from behind her right ear.

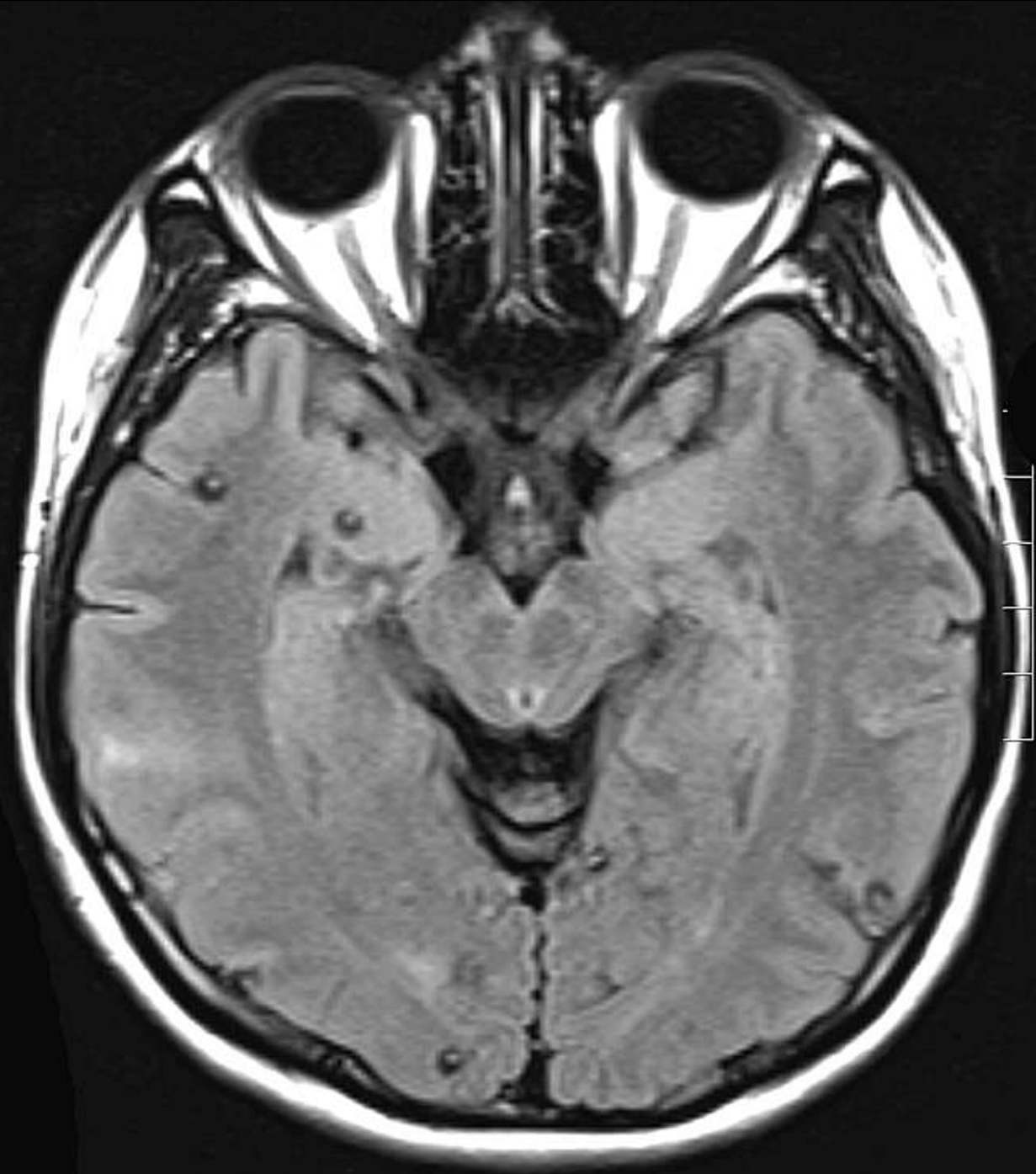
This was causing irritation to her glasses.

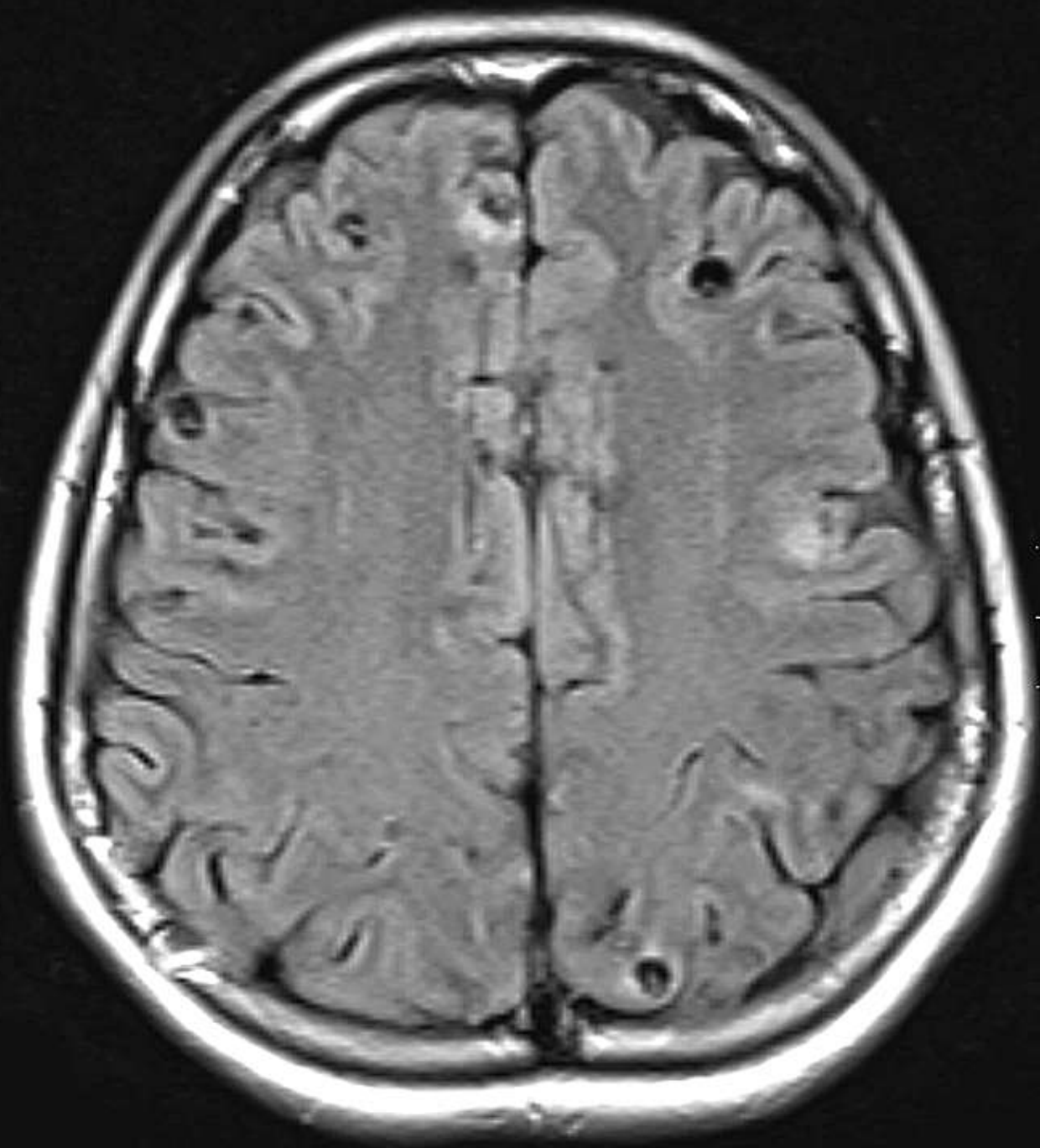
By this time she had had a second course of treatment.





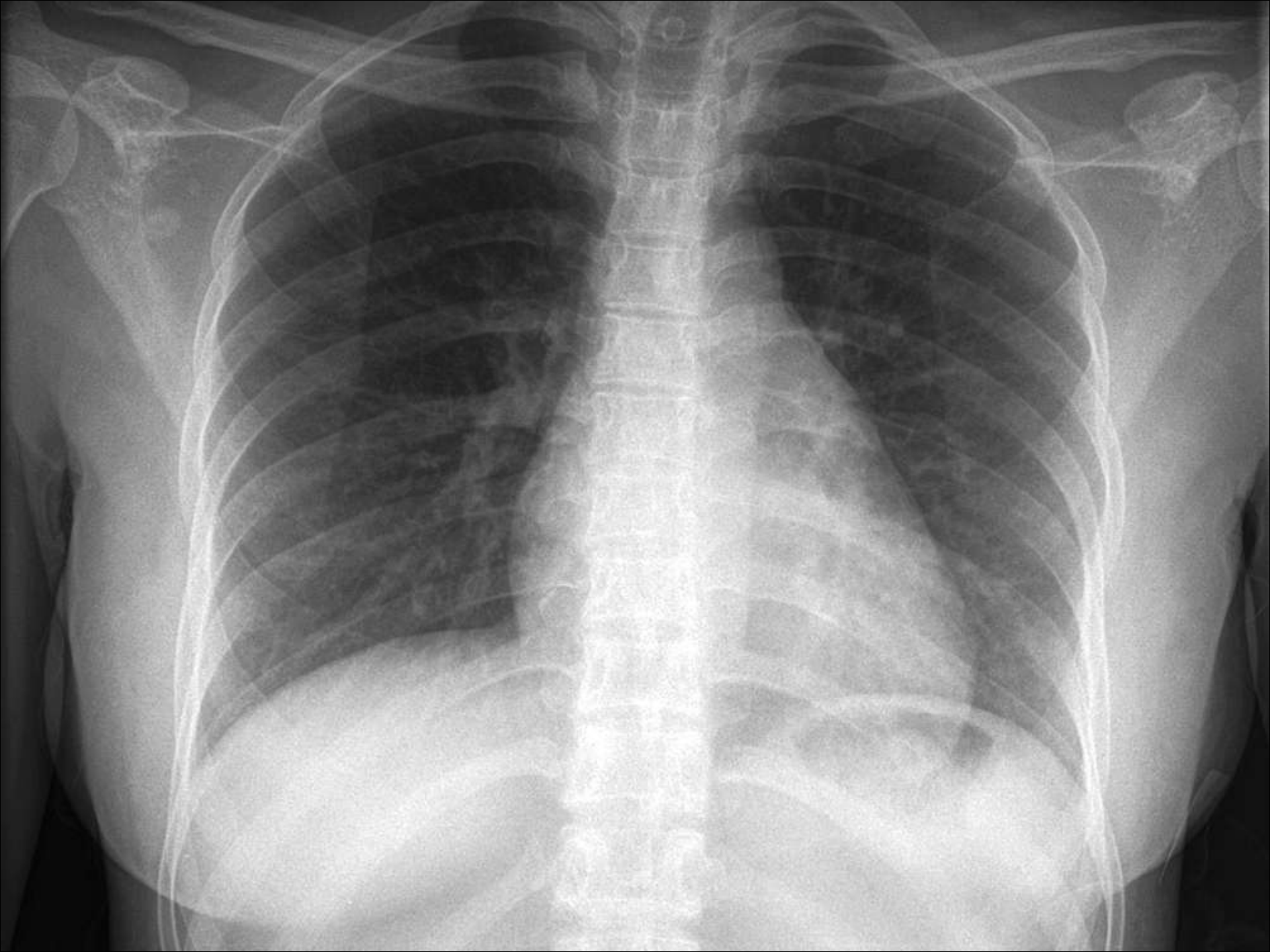
The CT of brain showed many fewer cysticerci than had been present before.





A chest X ray during this Sept. 2009 admission showed a rounded opacity over the right scapula that had not been seen before.

This was another subcutaneous cysticercus.

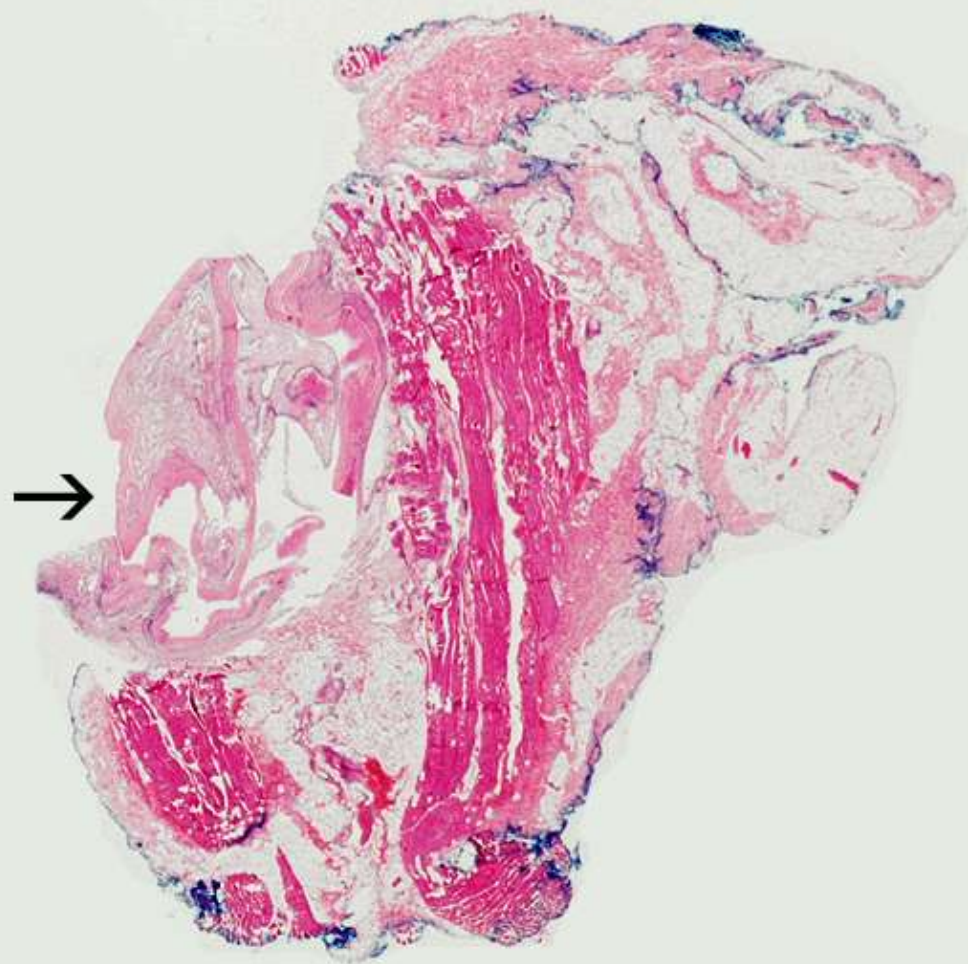
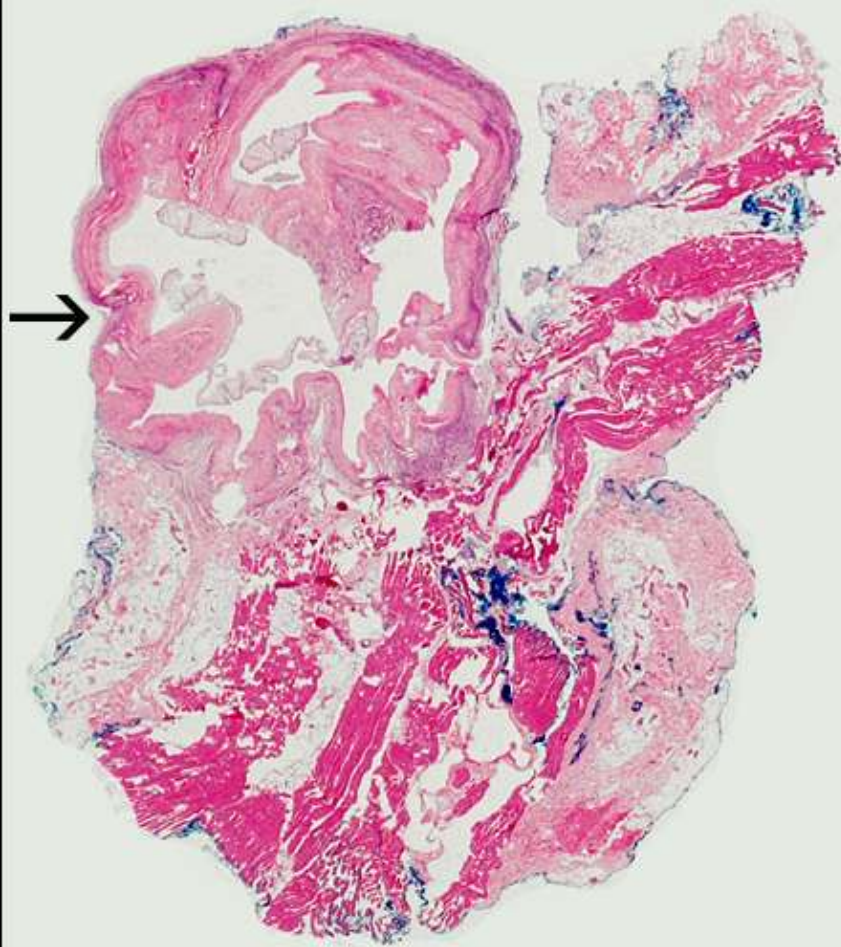


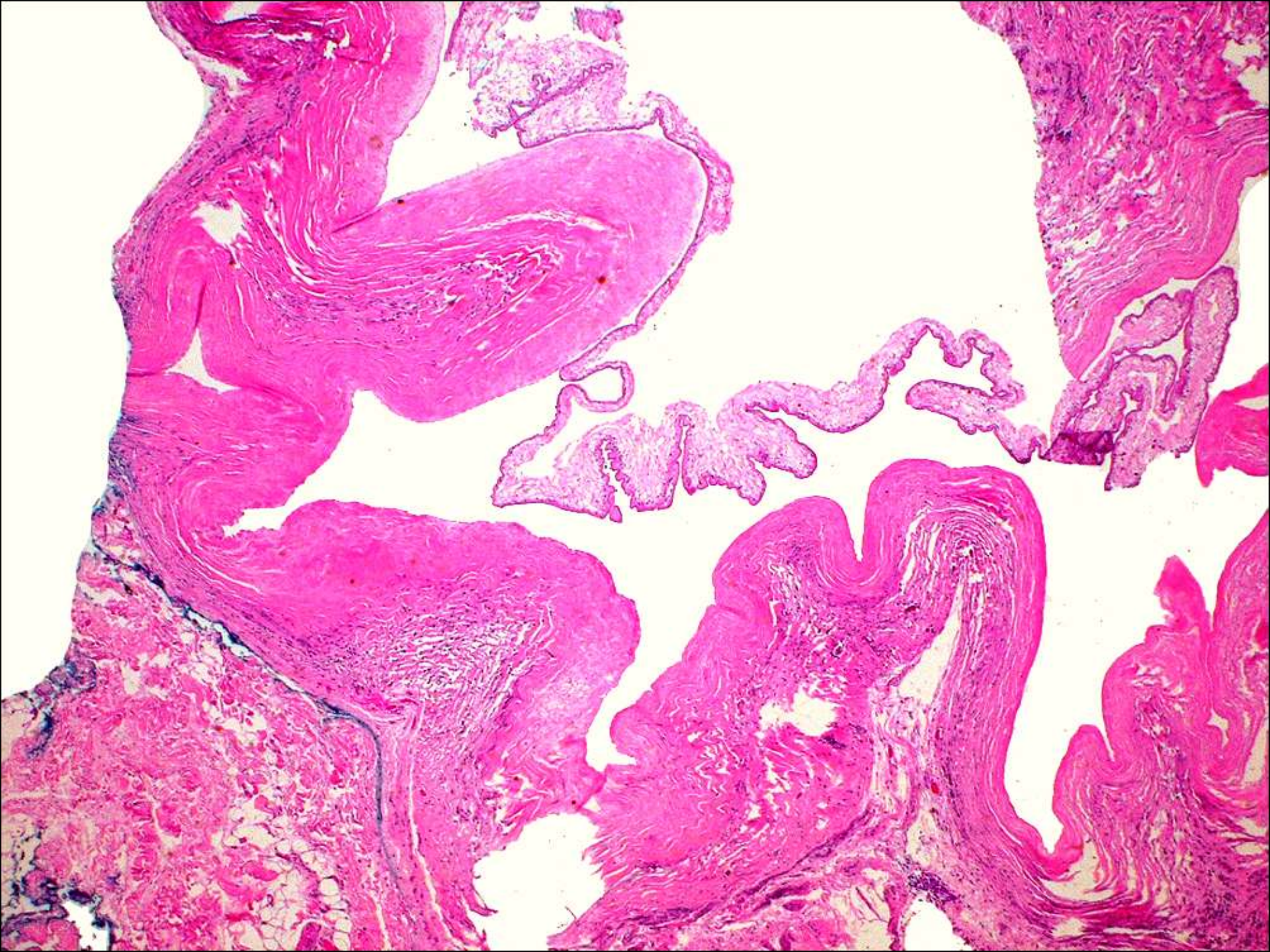
The operative specimen was submitted to the lab, and the cut up person sliced it in half, embedded half and left the other half in the specimen jar.

Some membrane was seen in the section, and fortunately when the rest of the specimen was 'rescued' from the specimen jar more membrane was found.

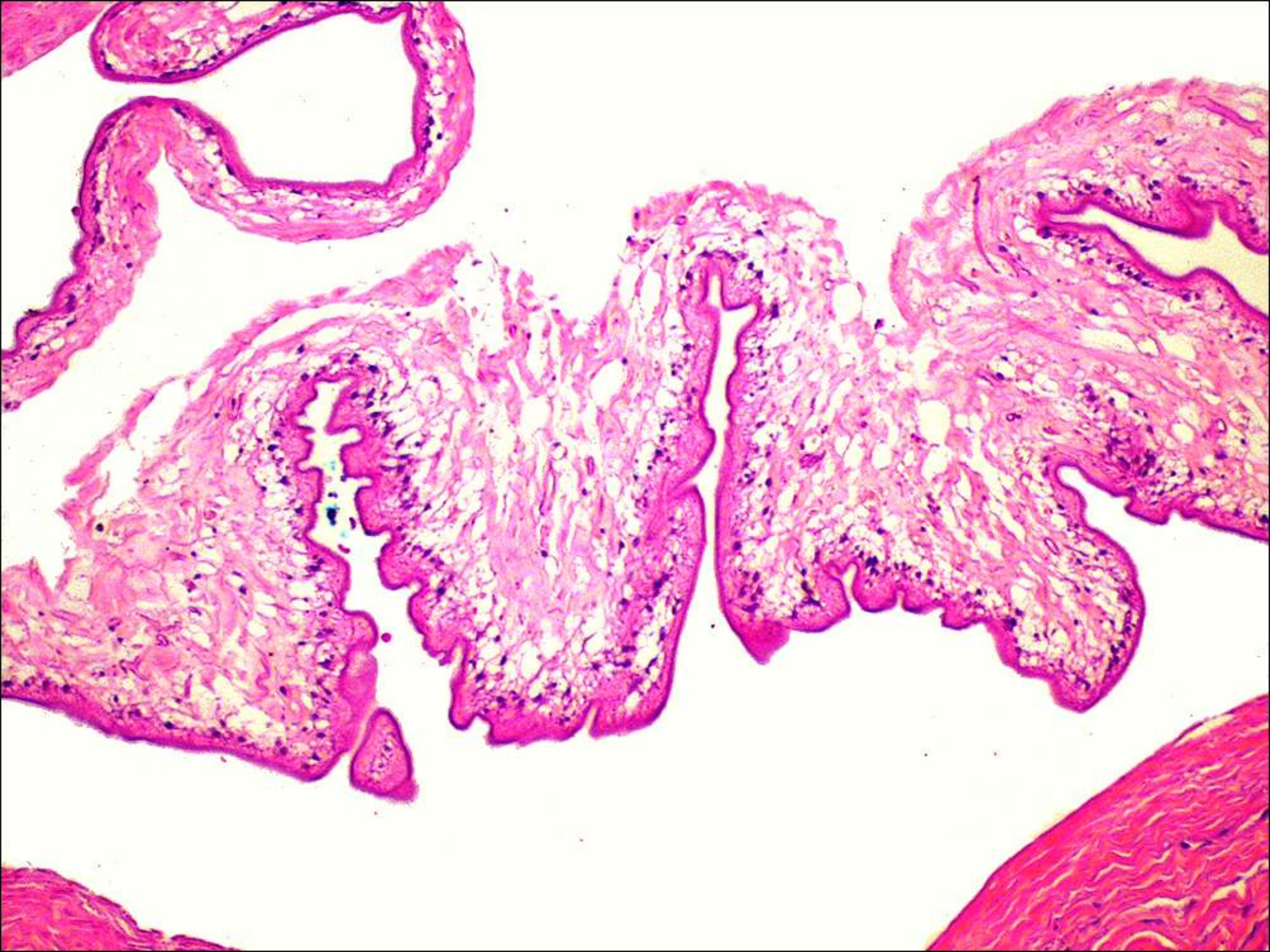
No worm head was found.

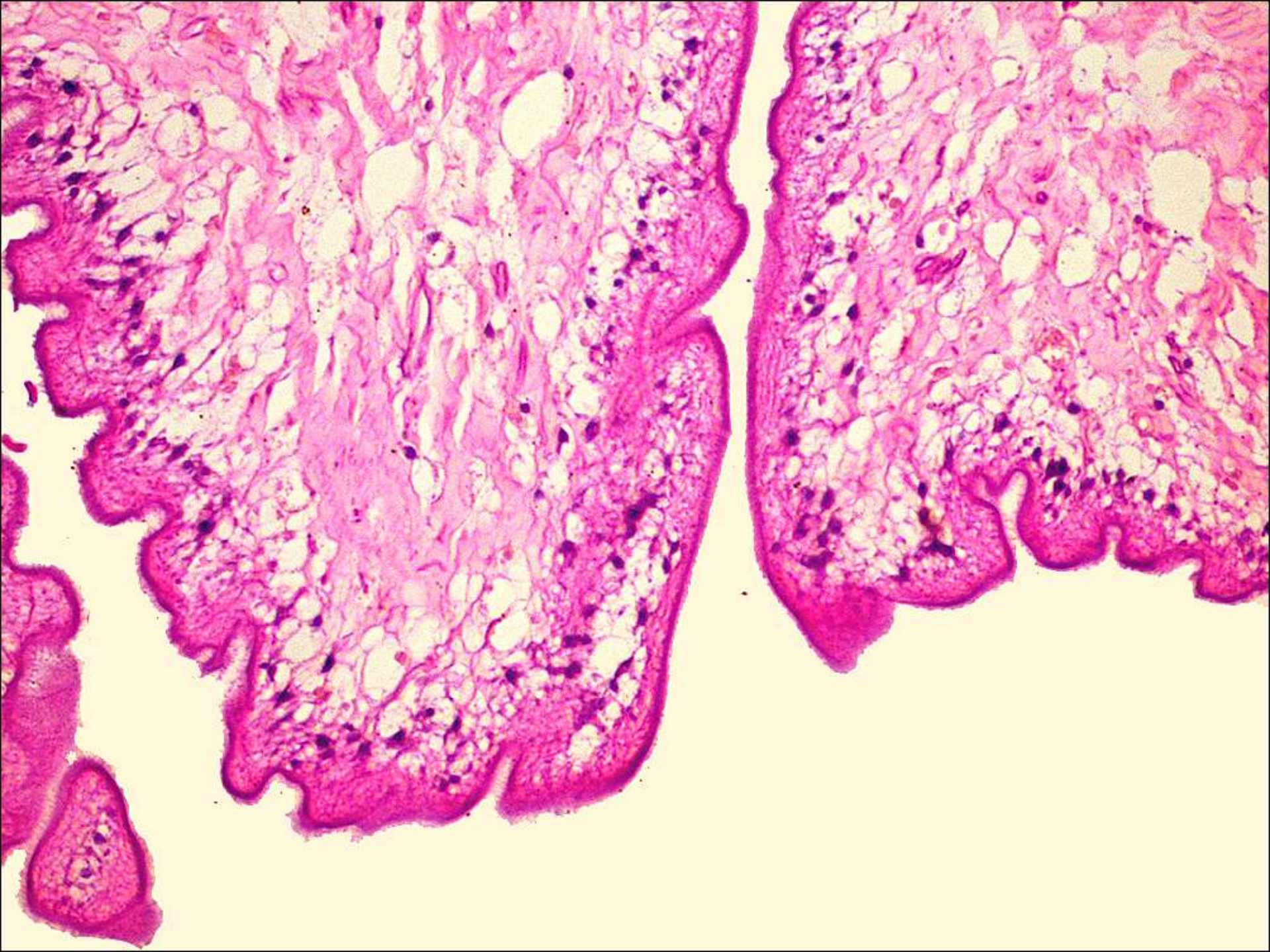
Presumably because it had been killed by the treatment.

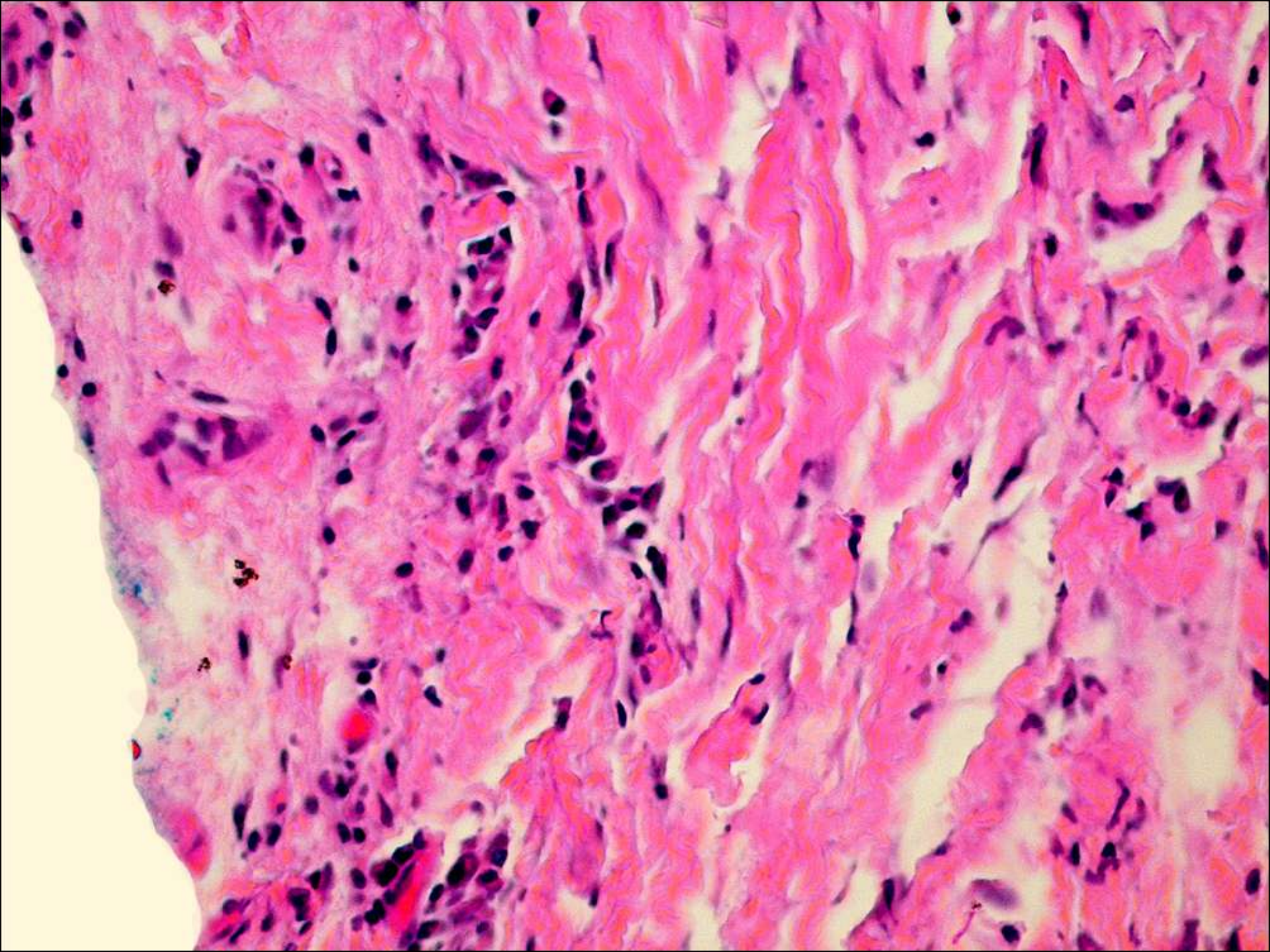


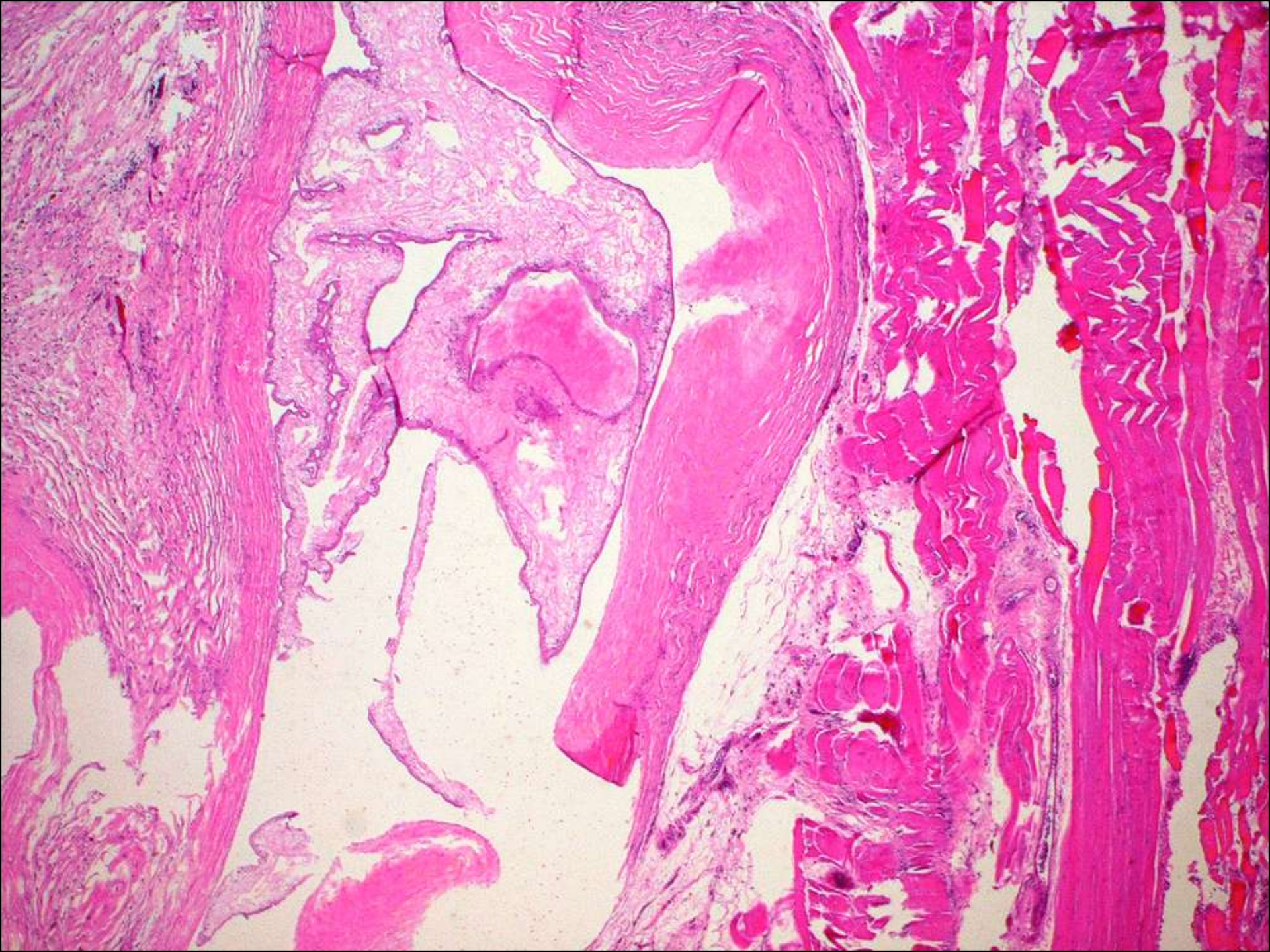










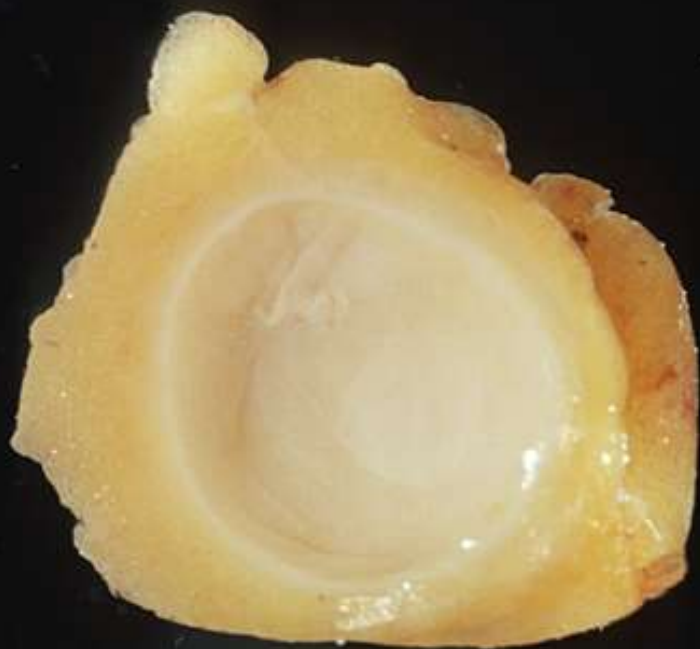
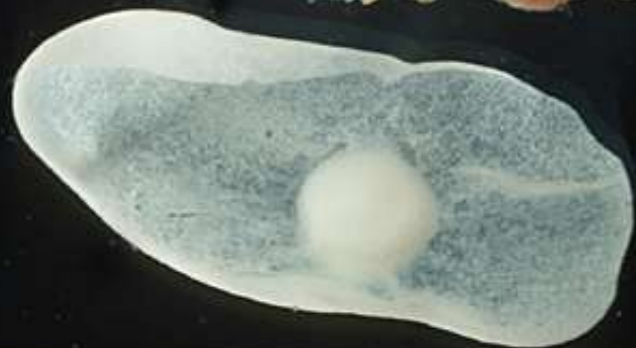


Gross appearance of a subcutaneous cysticercus.

When the cyst is cut across one sees a thin, white transparent membrane that floats out of the cyst.

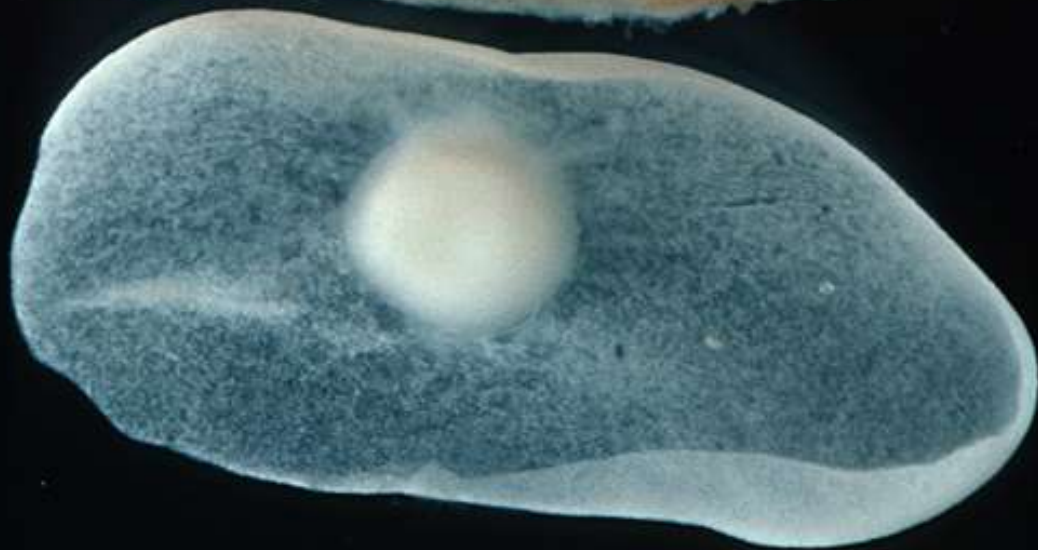
In one half of this transparent membrane one sees a white nodule.

This is the head of the new *Taenia solium* worm.





←A



←B

If this is left in the specimen jar, or worse washed down the sink, one cannot make a diagnosis on the appearance of the cyst wall because this just shows a foreign body reaction.

Cysticercosis

Pig with adult *T. solium* in the intestine.



Eggs hatch in the intestine and the resulting oncospheres are carried in the blood to where they develop into cysticerci in muscle and other organs.



Humans eat infected, undercooked pig meat and the scolices in the cysticerci develop into an adult tapeworm in the small intestine.



Humans who already harbor an adult worm in their own intestine may get cysticercosis from ingesting eggs or gravid proglottids passed in their feces by hand-to-mouth infection—autoinfection.

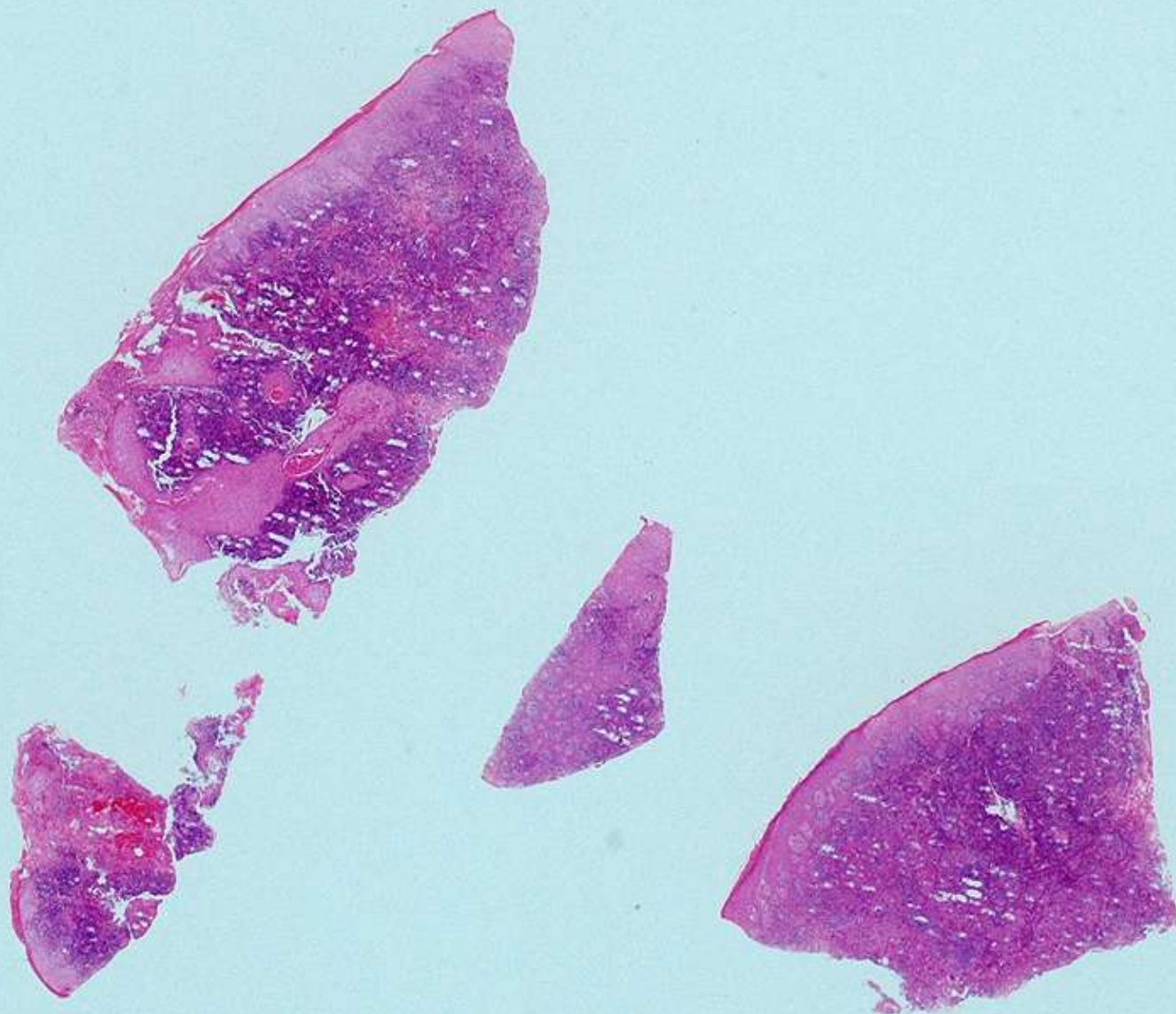
Cutaneous leishmaniasis

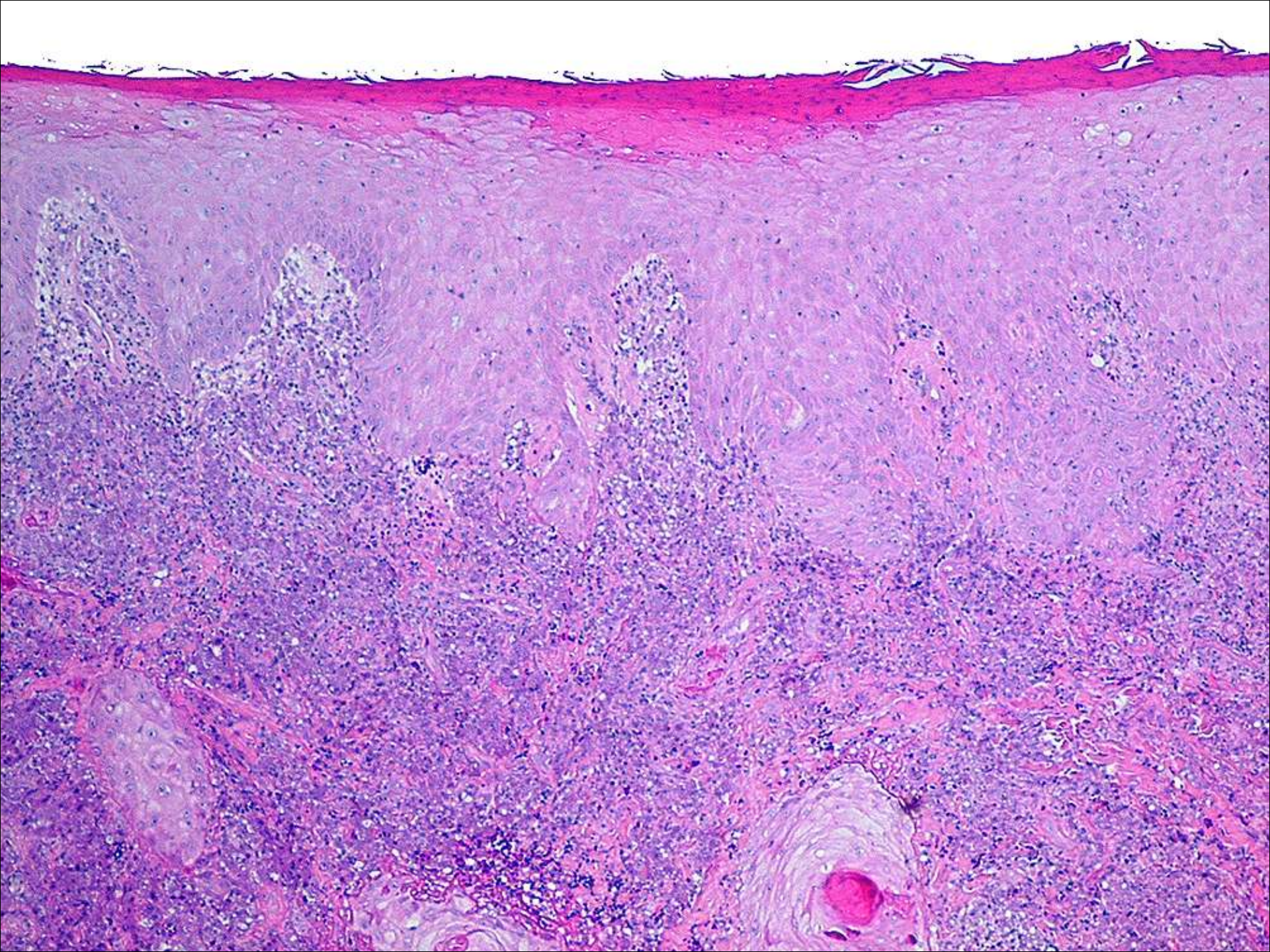
A M 25 Afghan refugee to Australia presented with a non healing ulcer on the dorsum of the right foot.

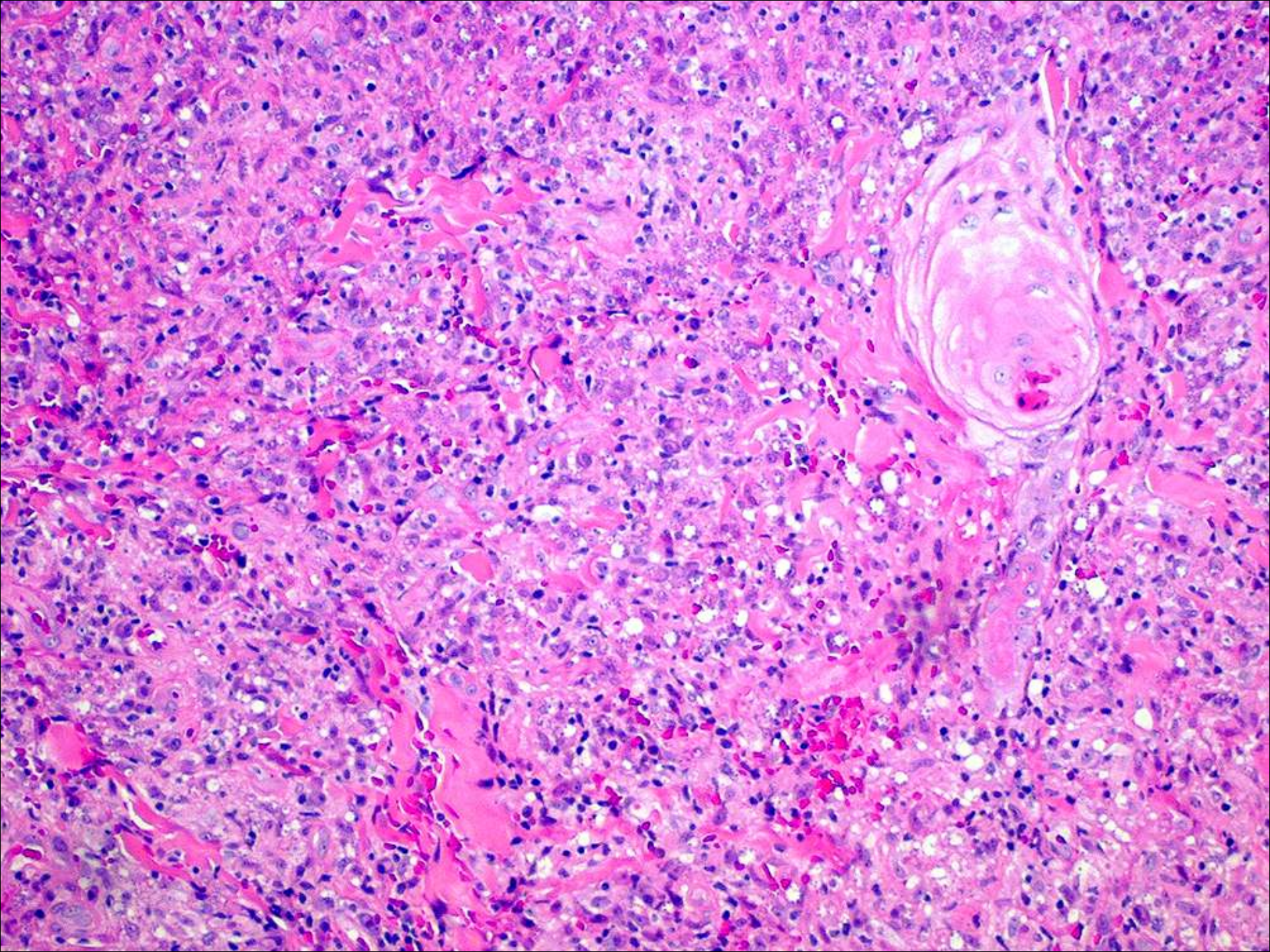
Examination revealed a similar but smaller ulcer on the dorsum of his left foot.

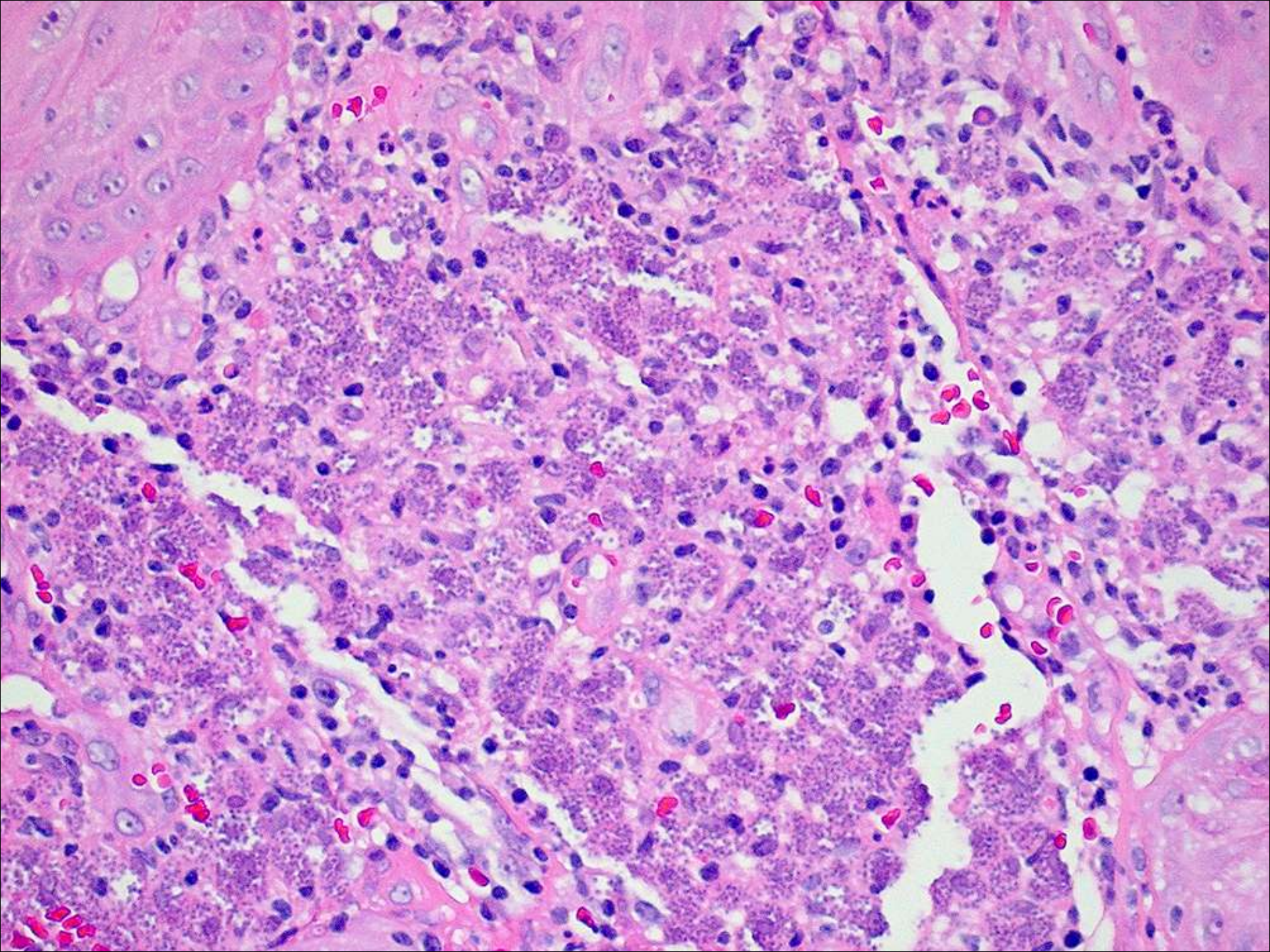
He had been in Australia for 3 months.

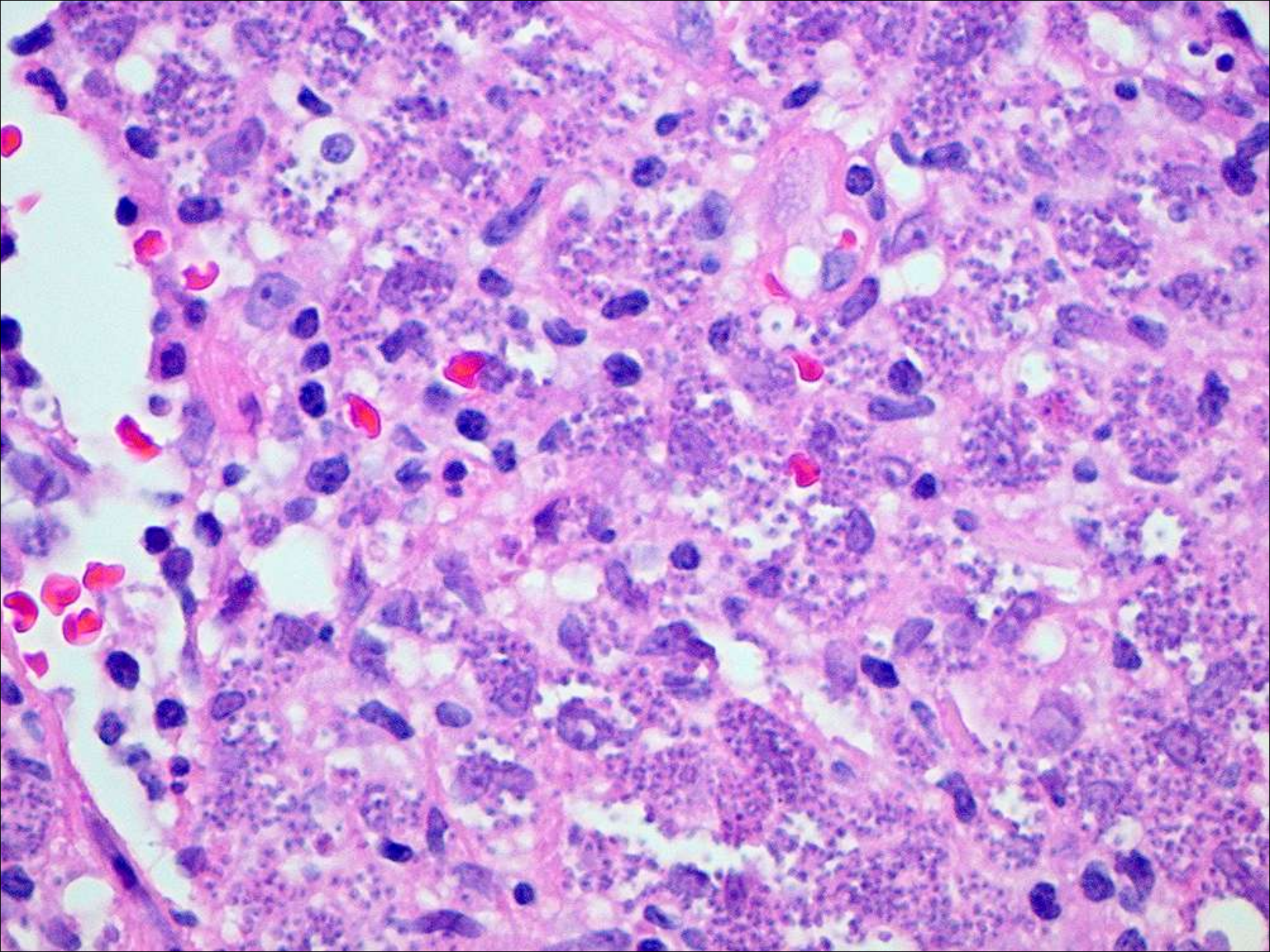


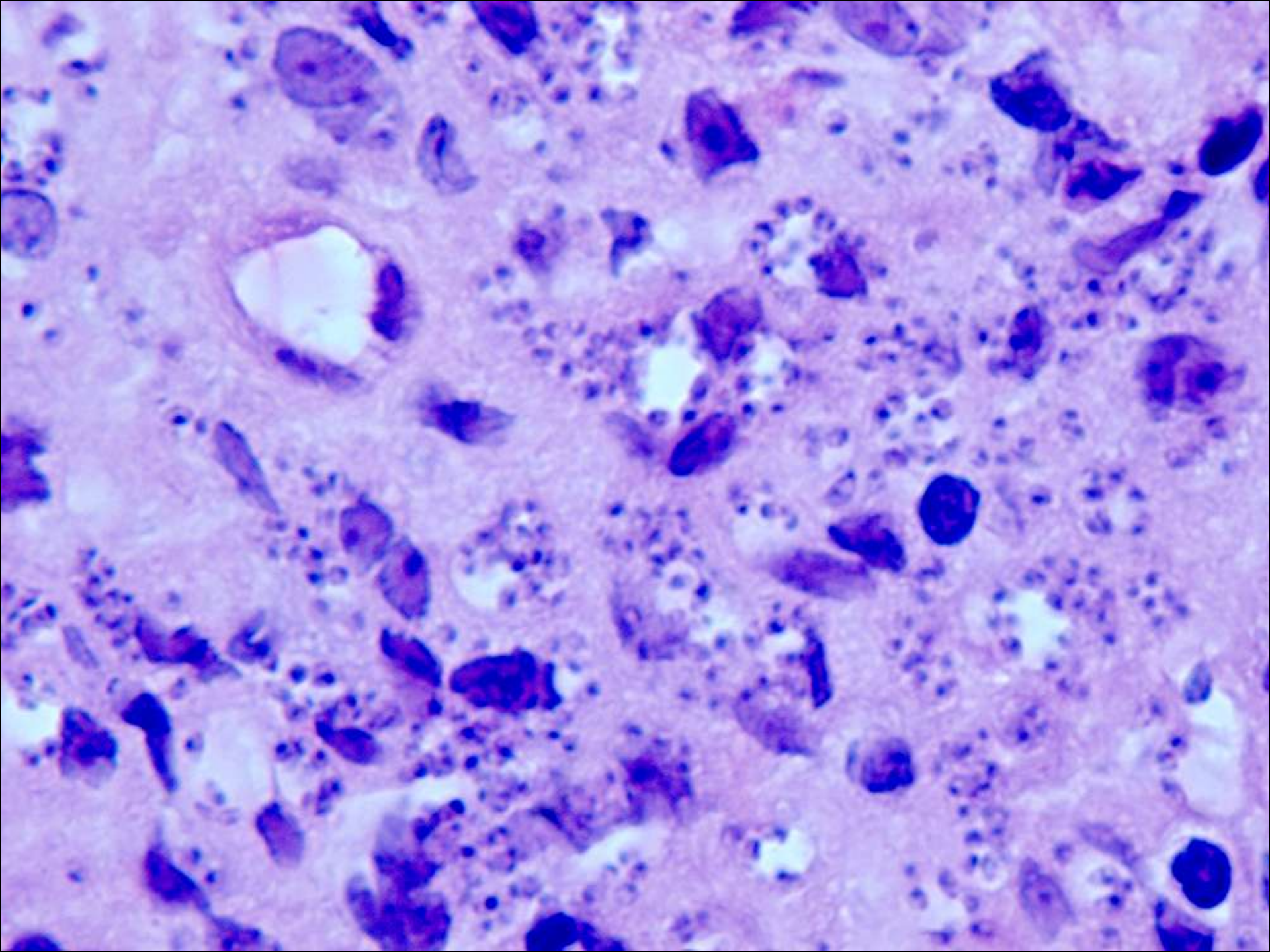












Cutaneous leishmaniasis in Australian Servicemen serving in Iraq

Cases donated
by

Jenny Robson

Head microbiology department
and Infectious Diseases Physician
S&N Pathology, Brisbane, Australia

Approximately 10 weeks after returning from a tour of duty in southern Iraq, four young Australian soldiers complained of having non healing cutaneous ulcers.

Three of them had ulcers on their forearms and one had ulcers around his right and left medial malleoli.

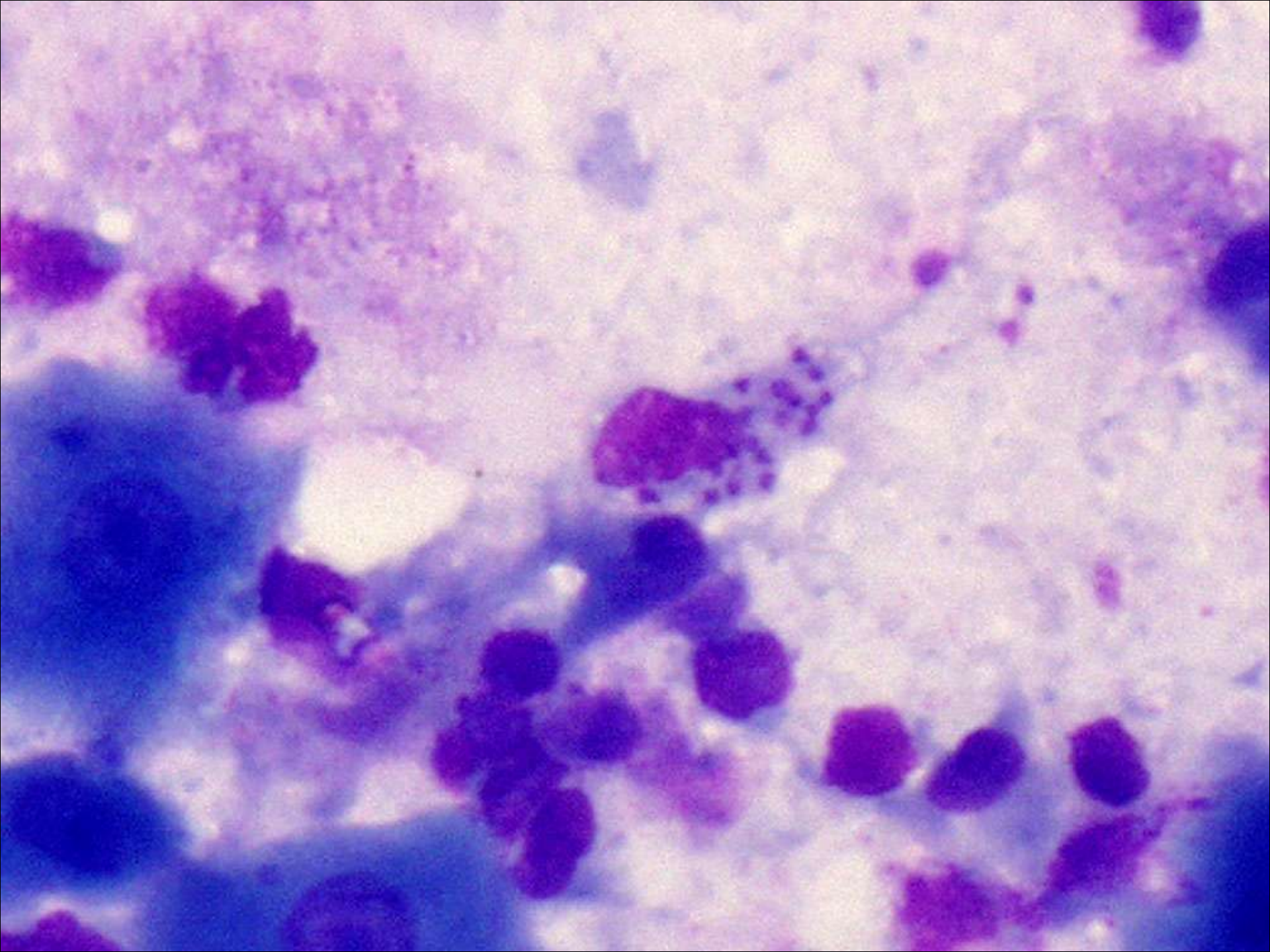




Biopsies of the ulcers were taken from all of the soldiers.

Touch preparations were made from the fresh biopsy tissue of two of them.

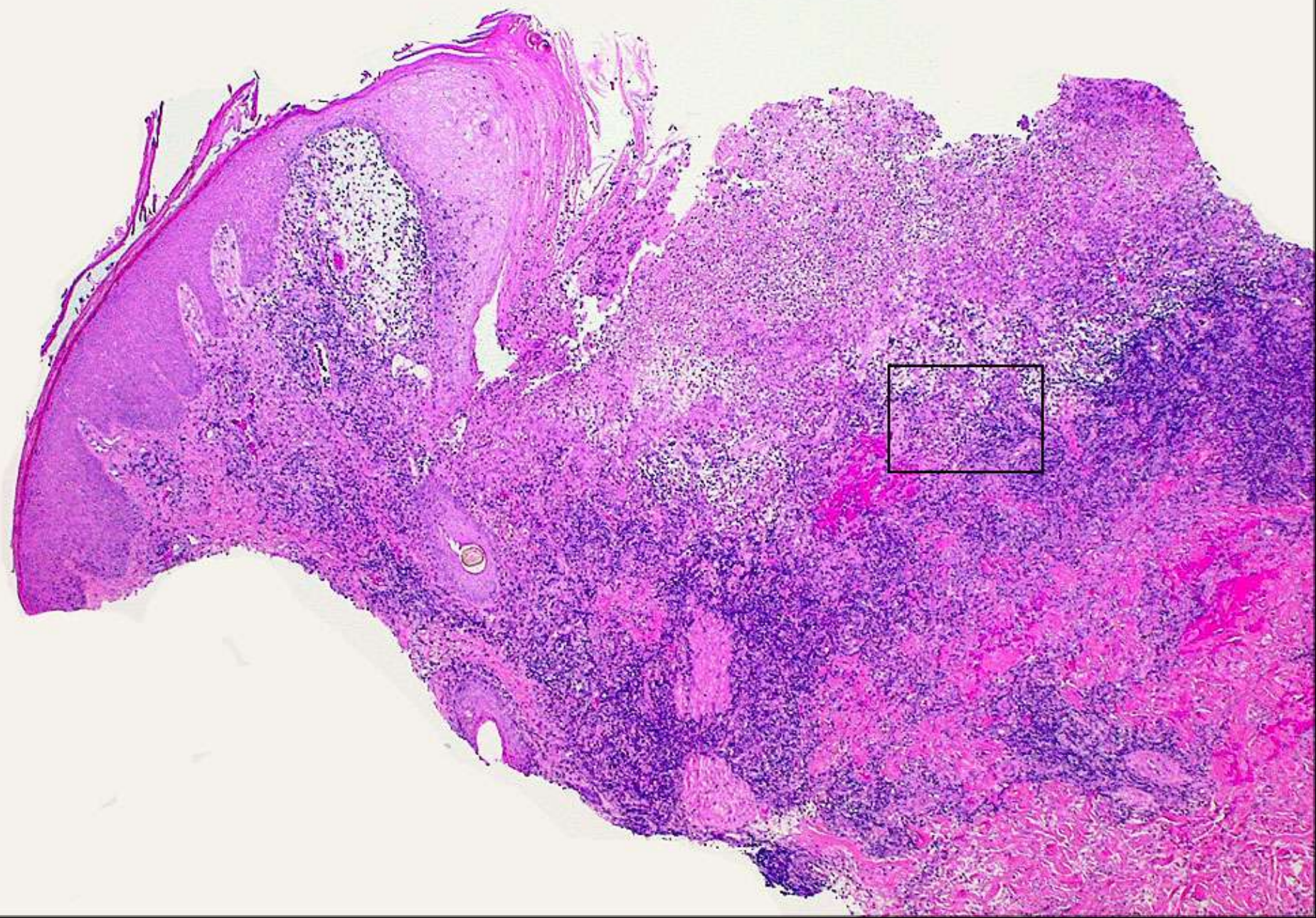
Both touch preparations showed intracellular amastigotes.

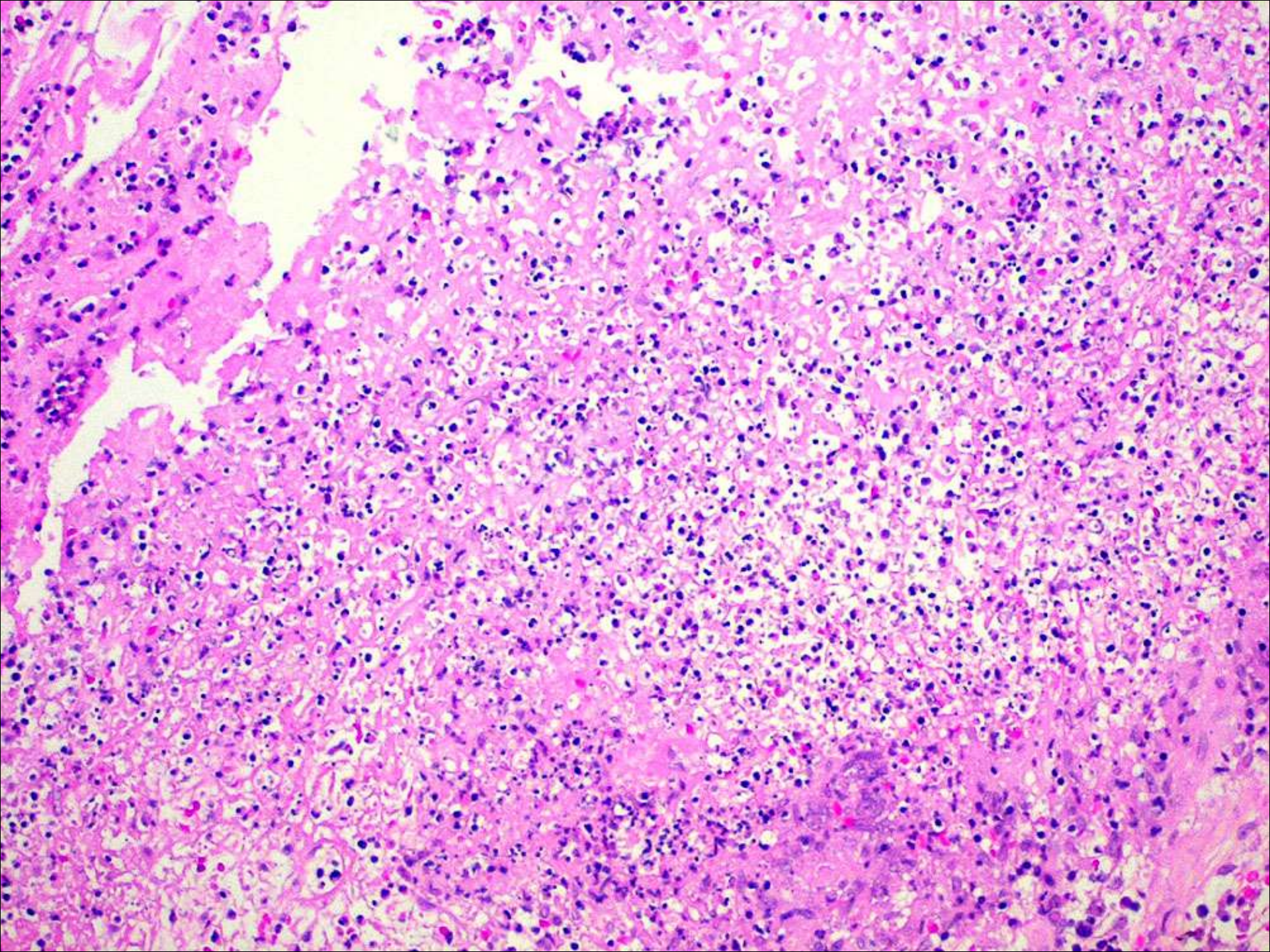


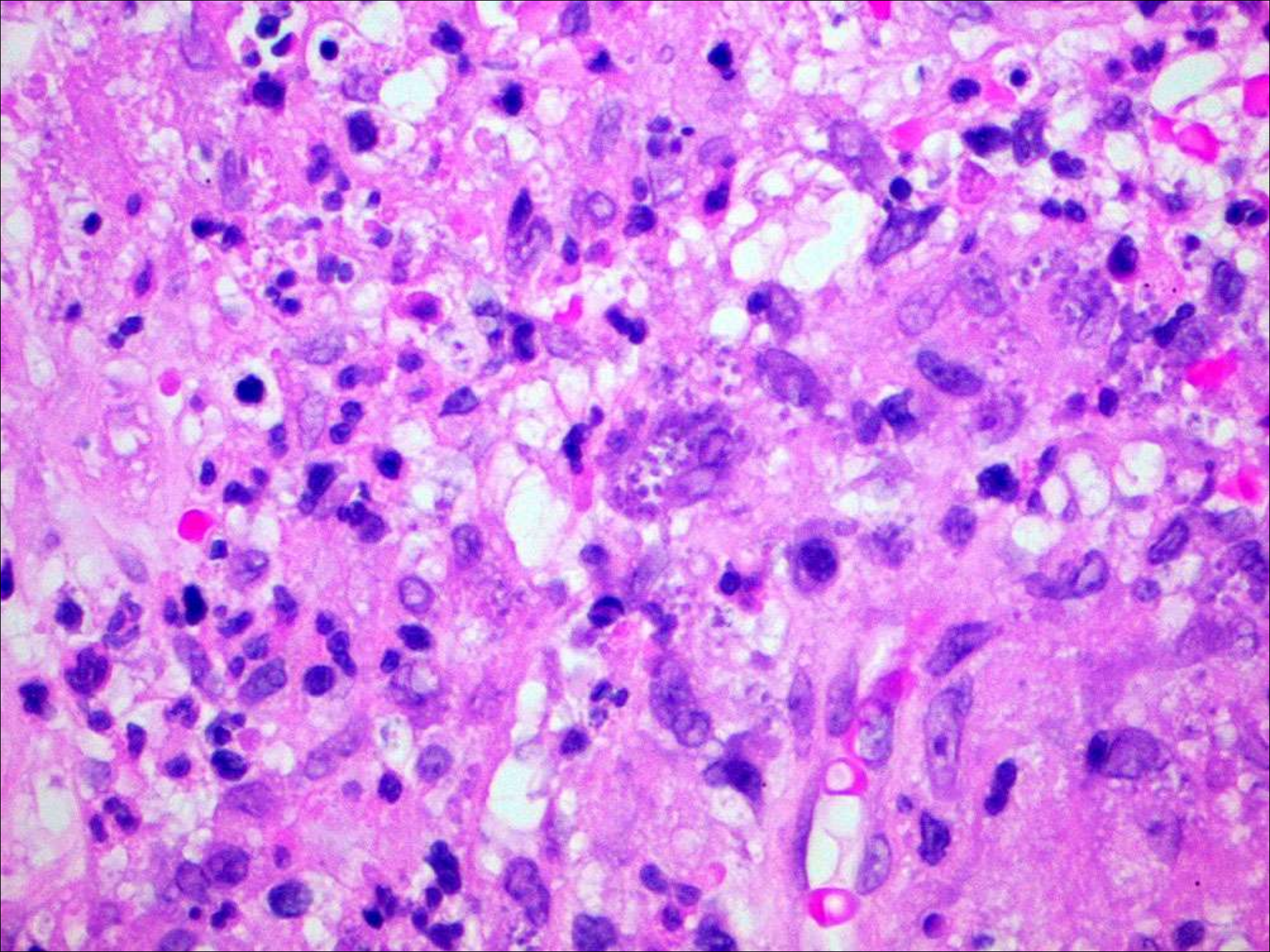
The biopsies showed an inflammatory infiltrate throughout the dermis.

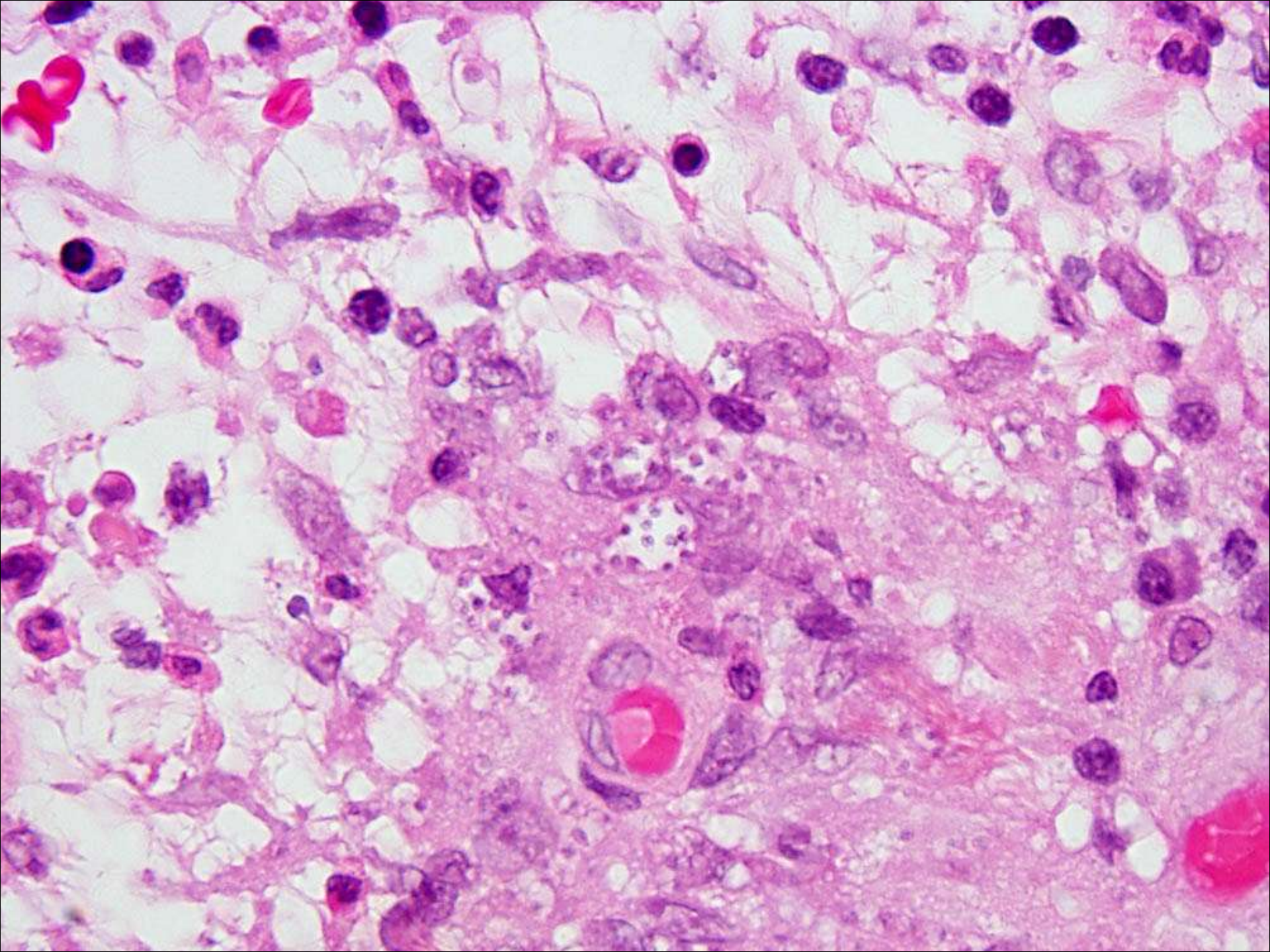
The inflammatory infiltrate was mainly monocytic with a few neutrophils.

Small numbers of histiocytes with intracellular parasitic amastigote forms were found.









The fresh biopsy tissue from all four patients was inoculated into Schneider's *Drosophila* medium. (Haemoflagellate medium).

All 4 gave a positive result.

Haemoflagellate medium
Batch 7G073 exp 5/01/08
Name:



Two cases donated by Selwa Sheik, Saudi Arabia to demonstrate the features seen in an area of endemic disease.

Case 1 shows an active immunological reaction

Case 2 shows a minimal immunological reaction.

Nested ITS1-PCR was performed on the cultured promastigotes.

The resulting ITS1 amplicon was digested with the restriction enzyme Hae II.

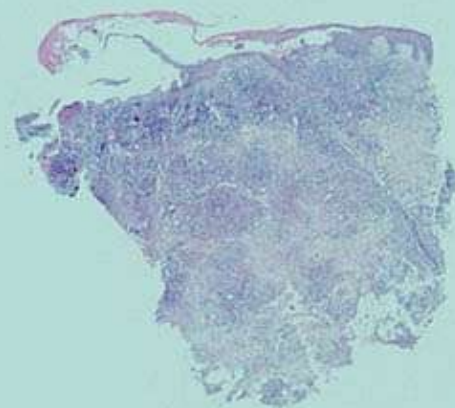
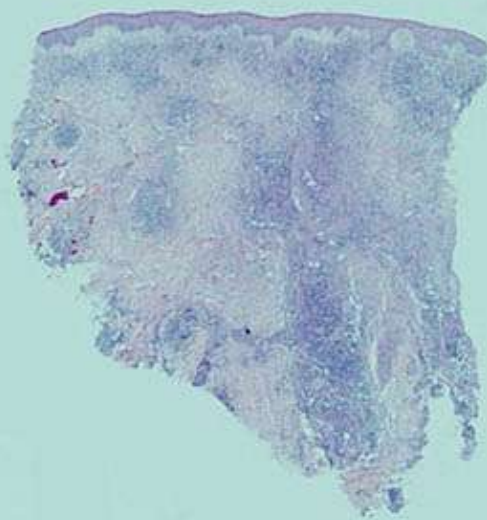
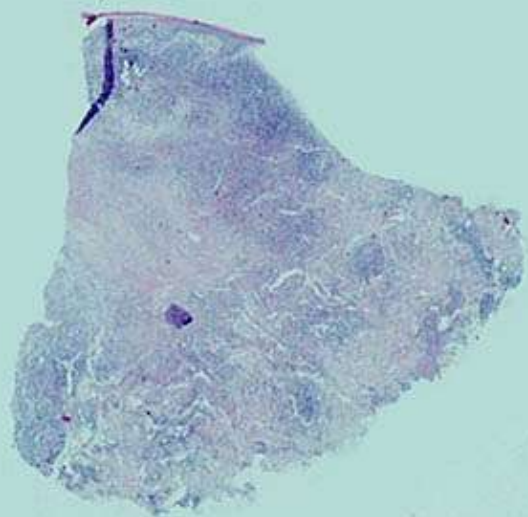
This identified the species in each case to be *Leishmania major*.

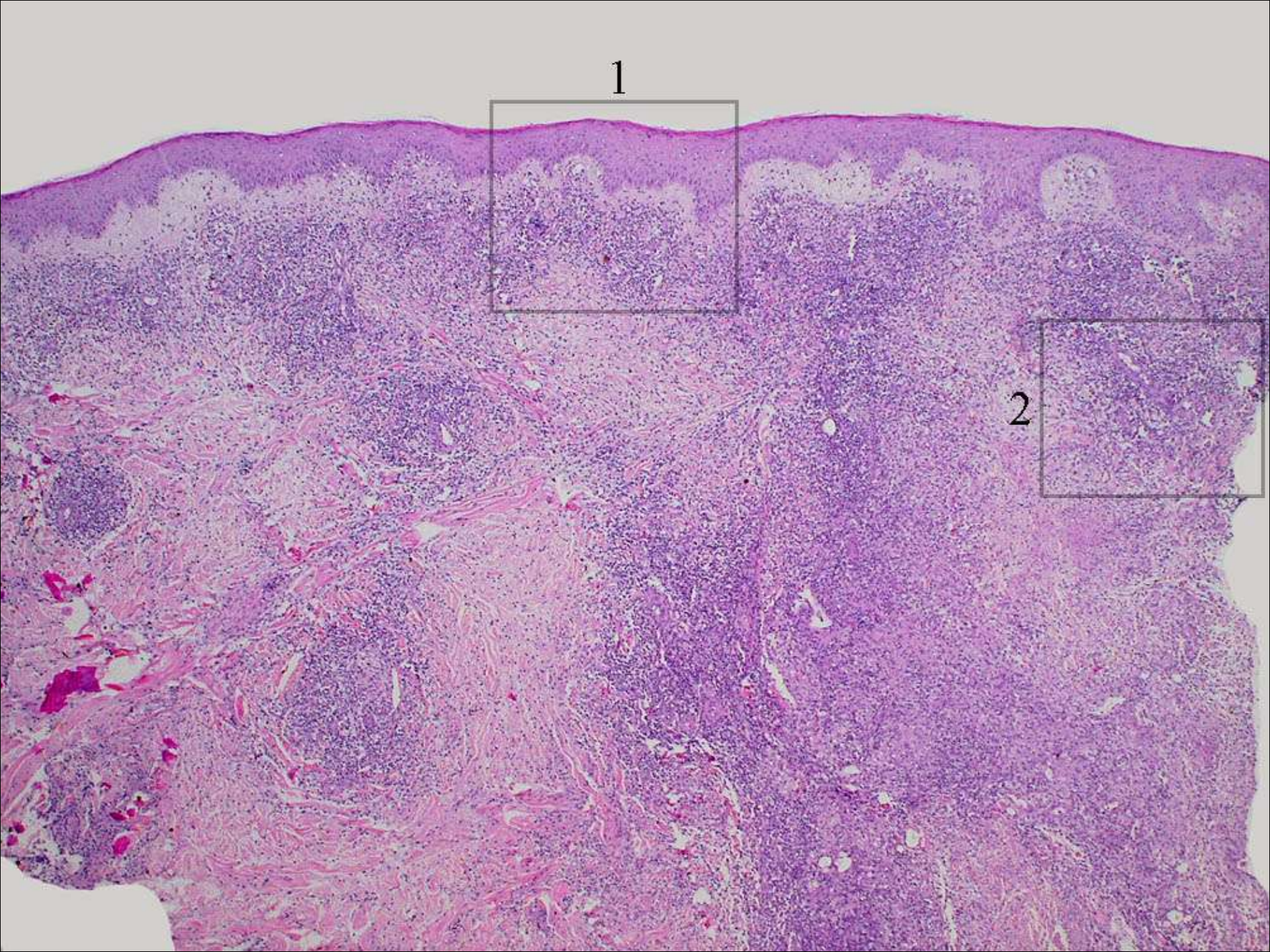
Case 1

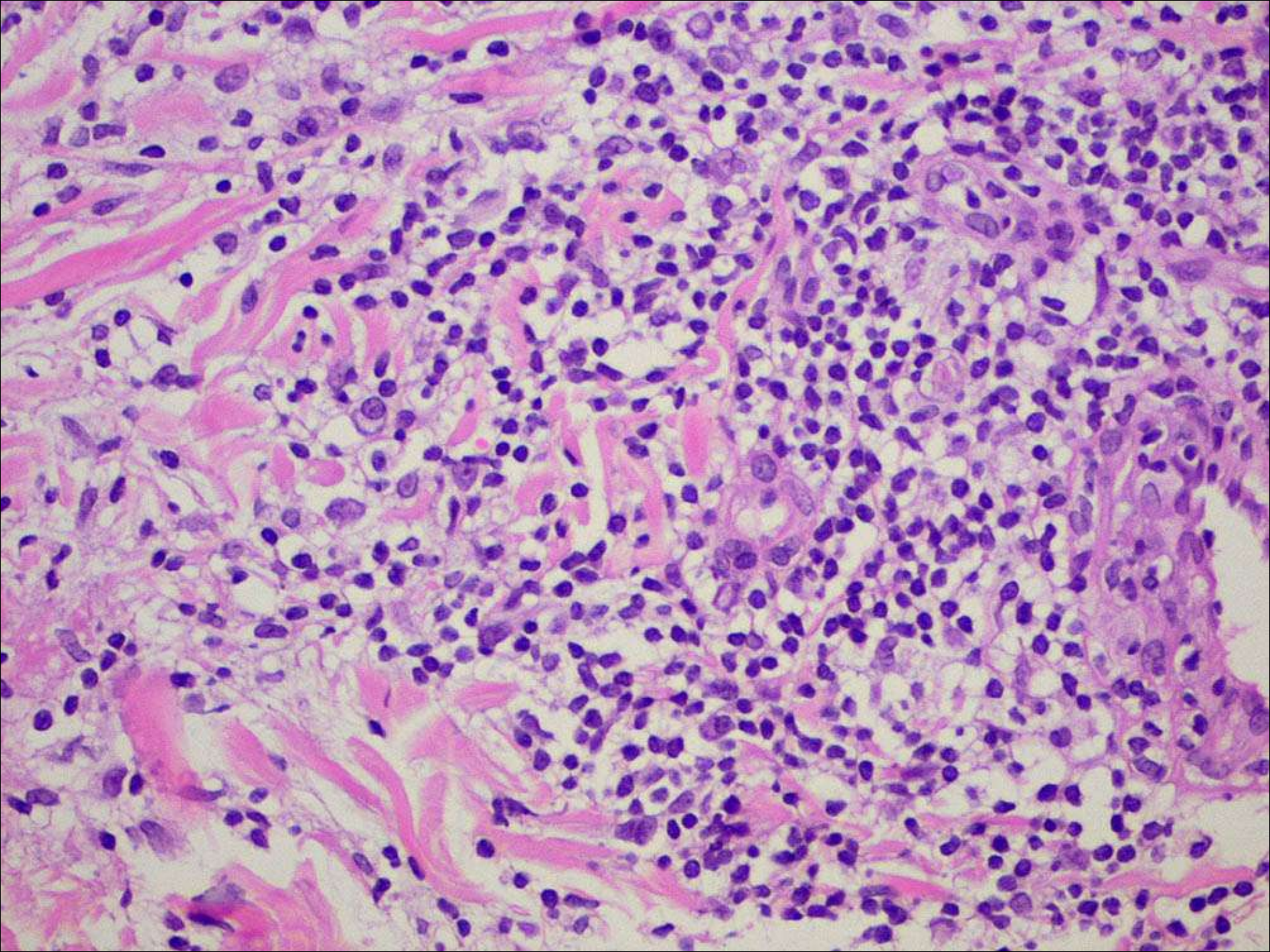
A 36 year old Syrian woman residing in Saudi Arabia presented with a long standing scaly skin lesion about 3 cm in diameter on her left forearm.

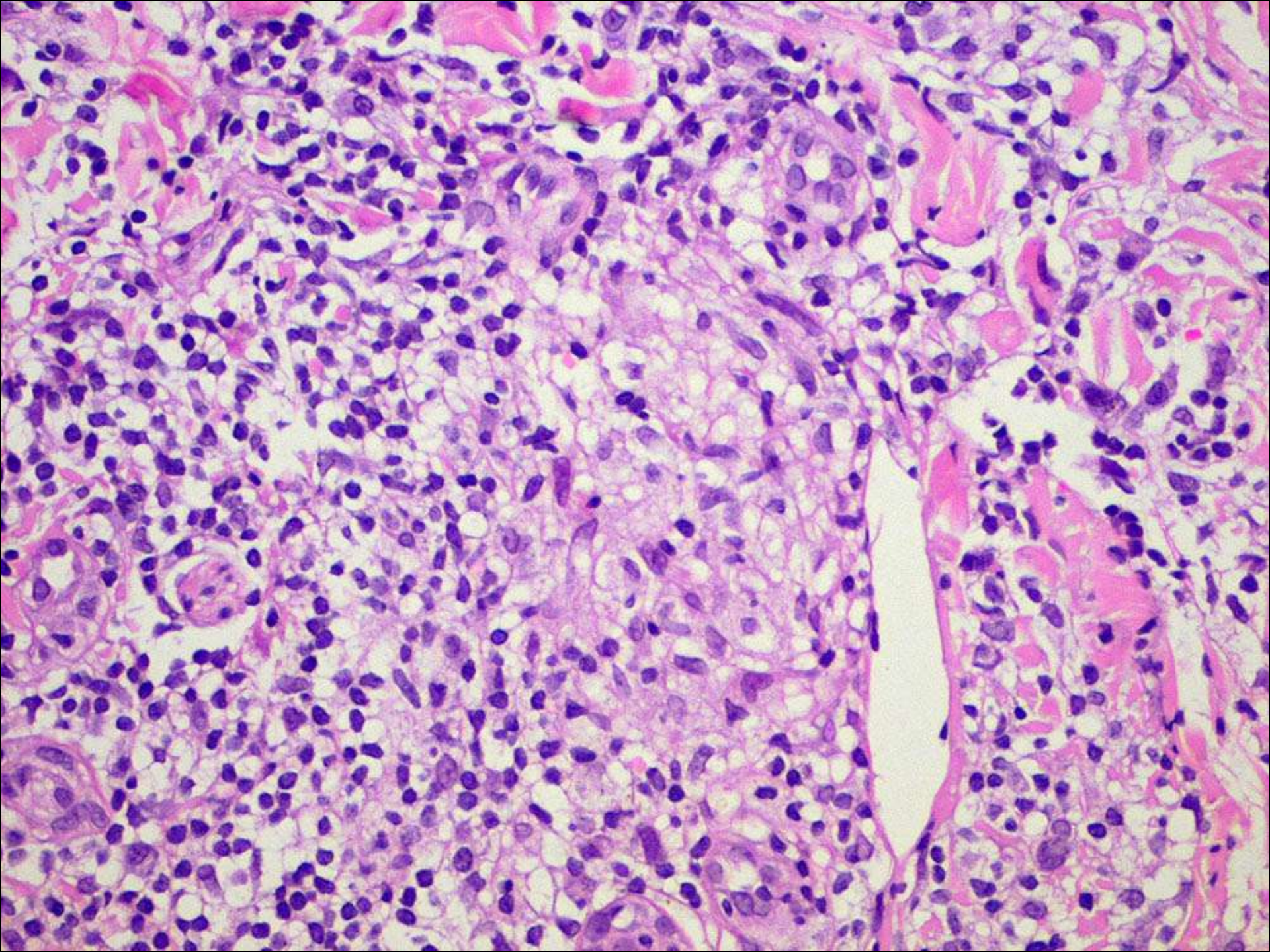
A 4 millimeter skin punch biopsy was obtained.

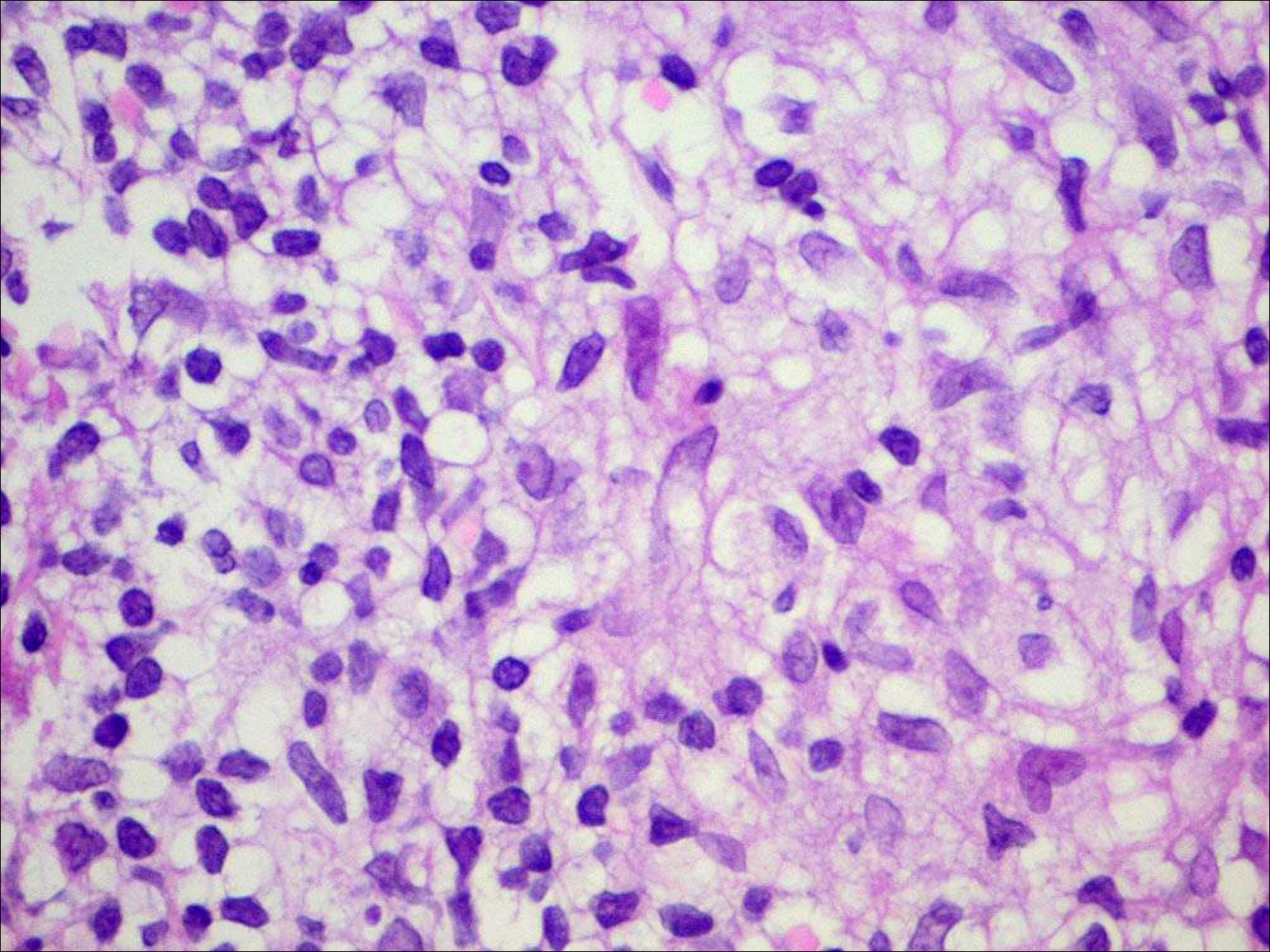
The lesion was present before her visit to Saudi Arabia.

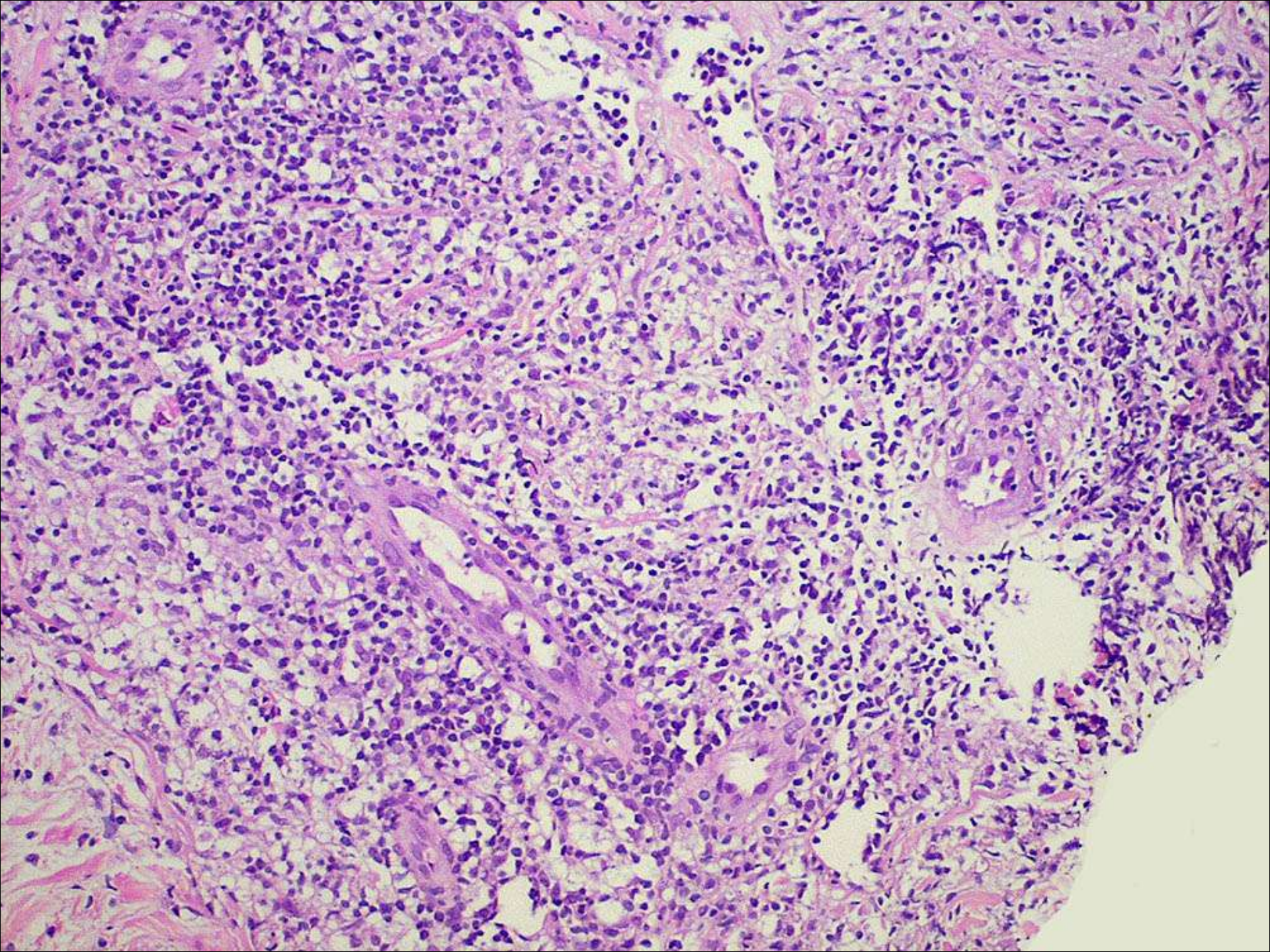


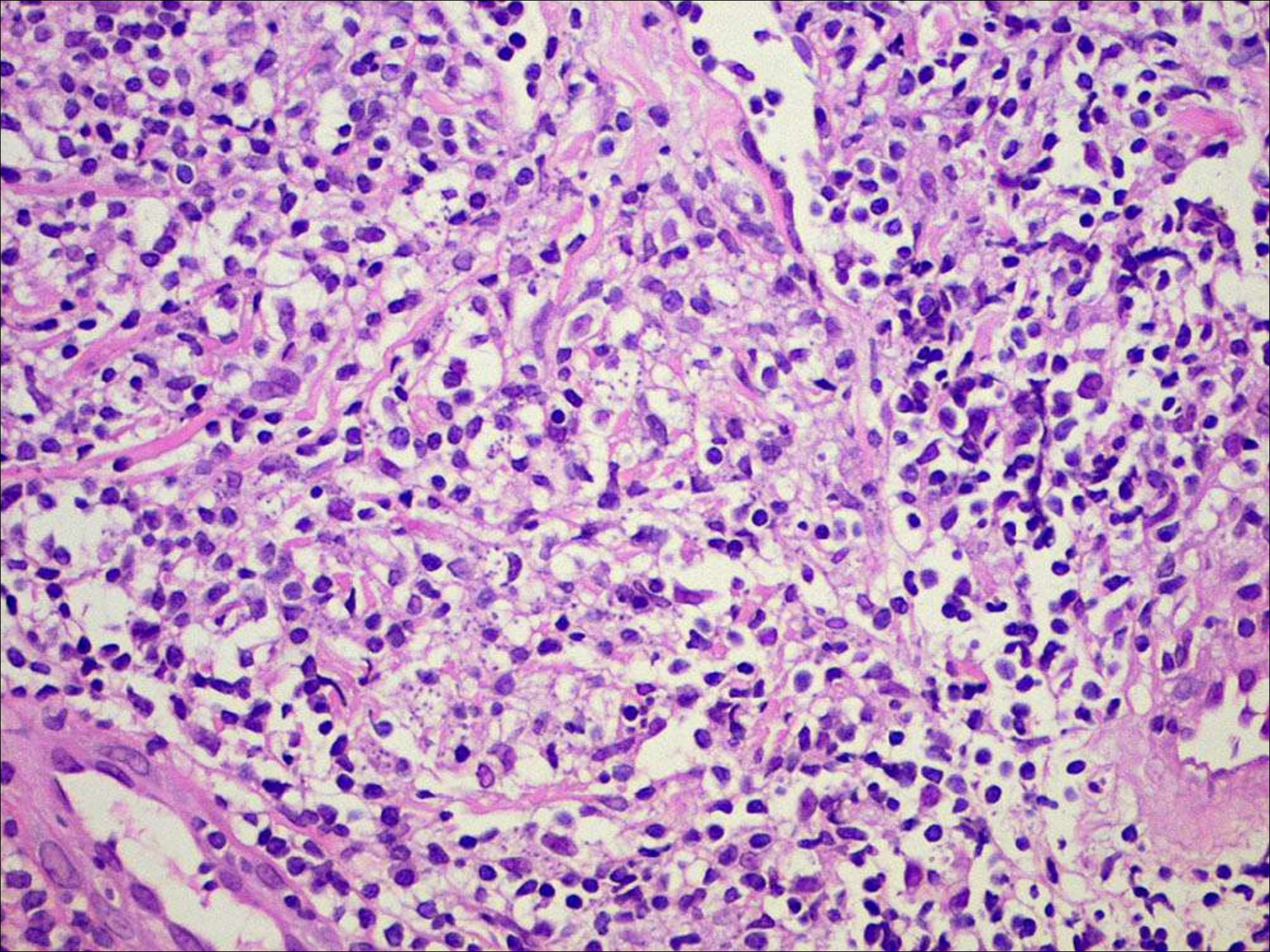


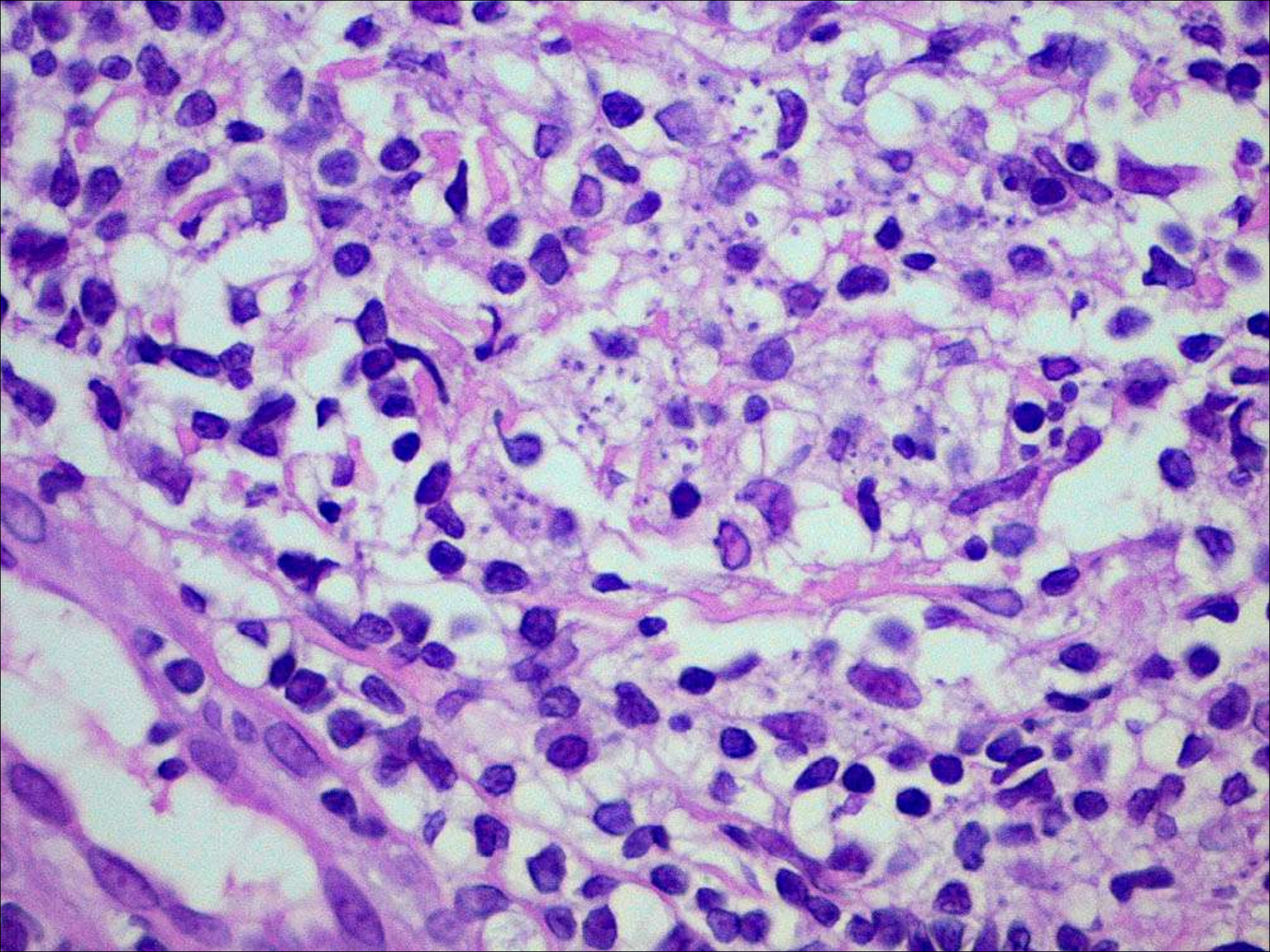


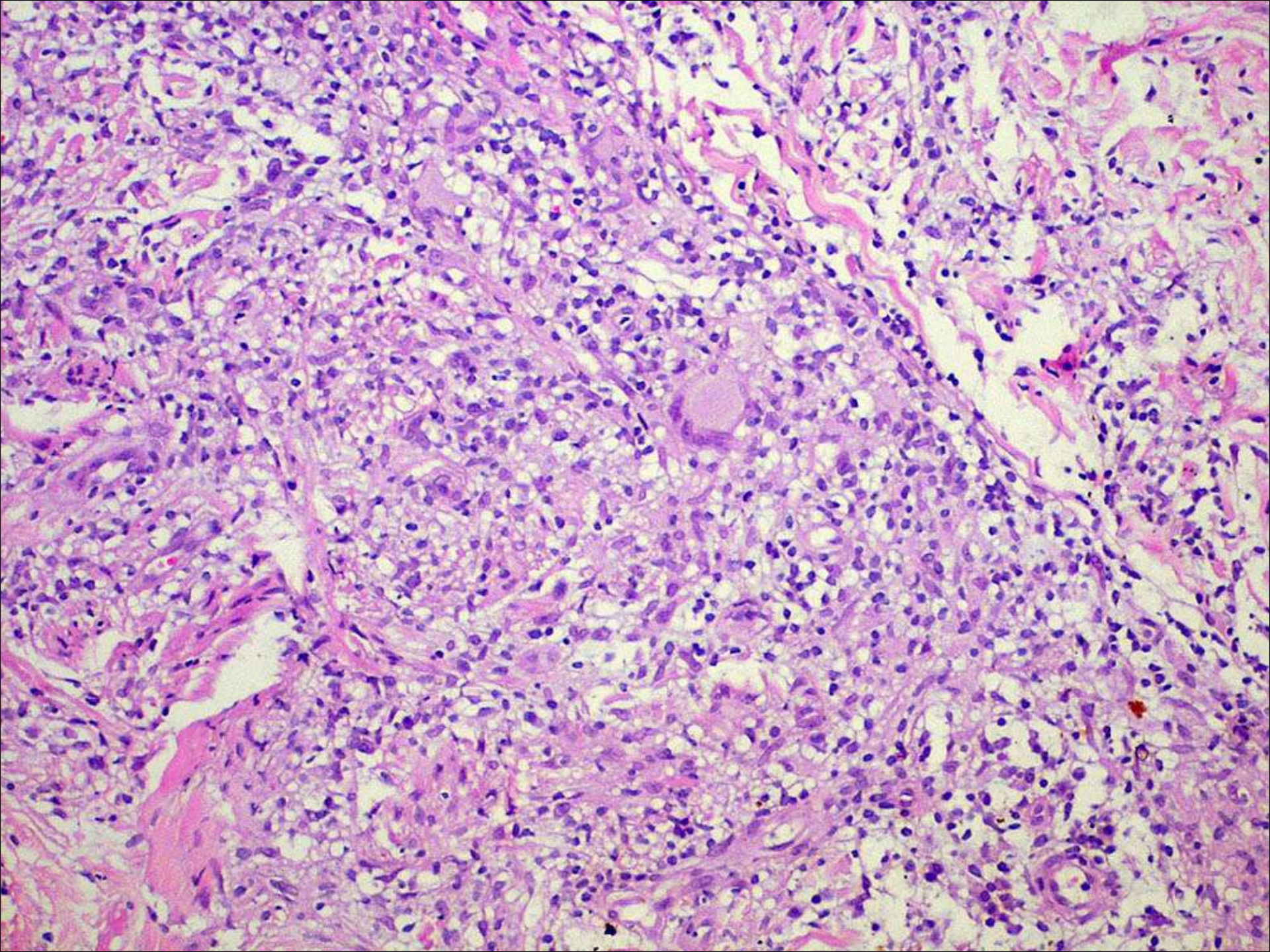


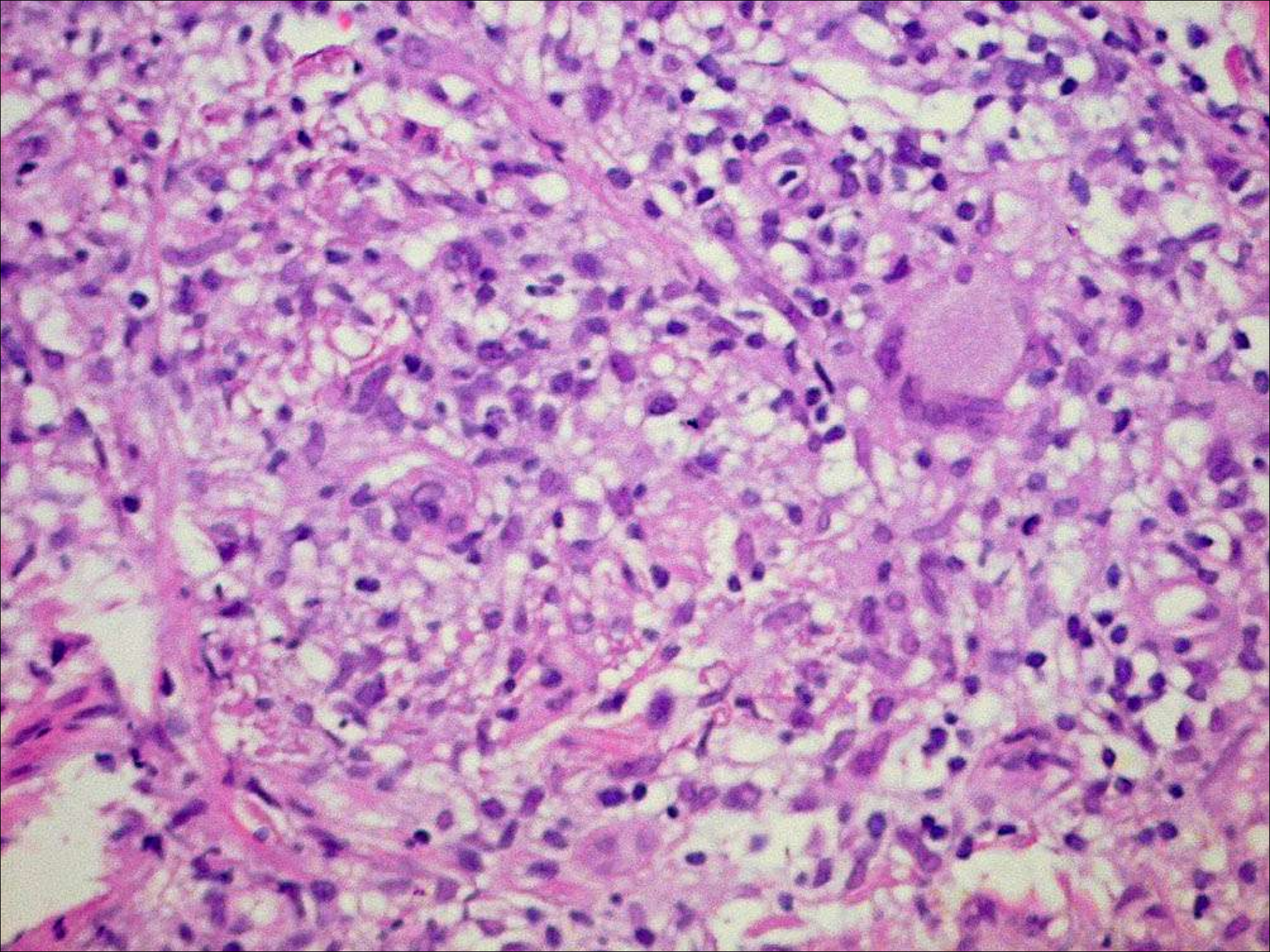












Case 1 has very few organisms with a few granulomas present.

This inflammatory reaction indicates the presence of some immunity to the infection.

Case 2

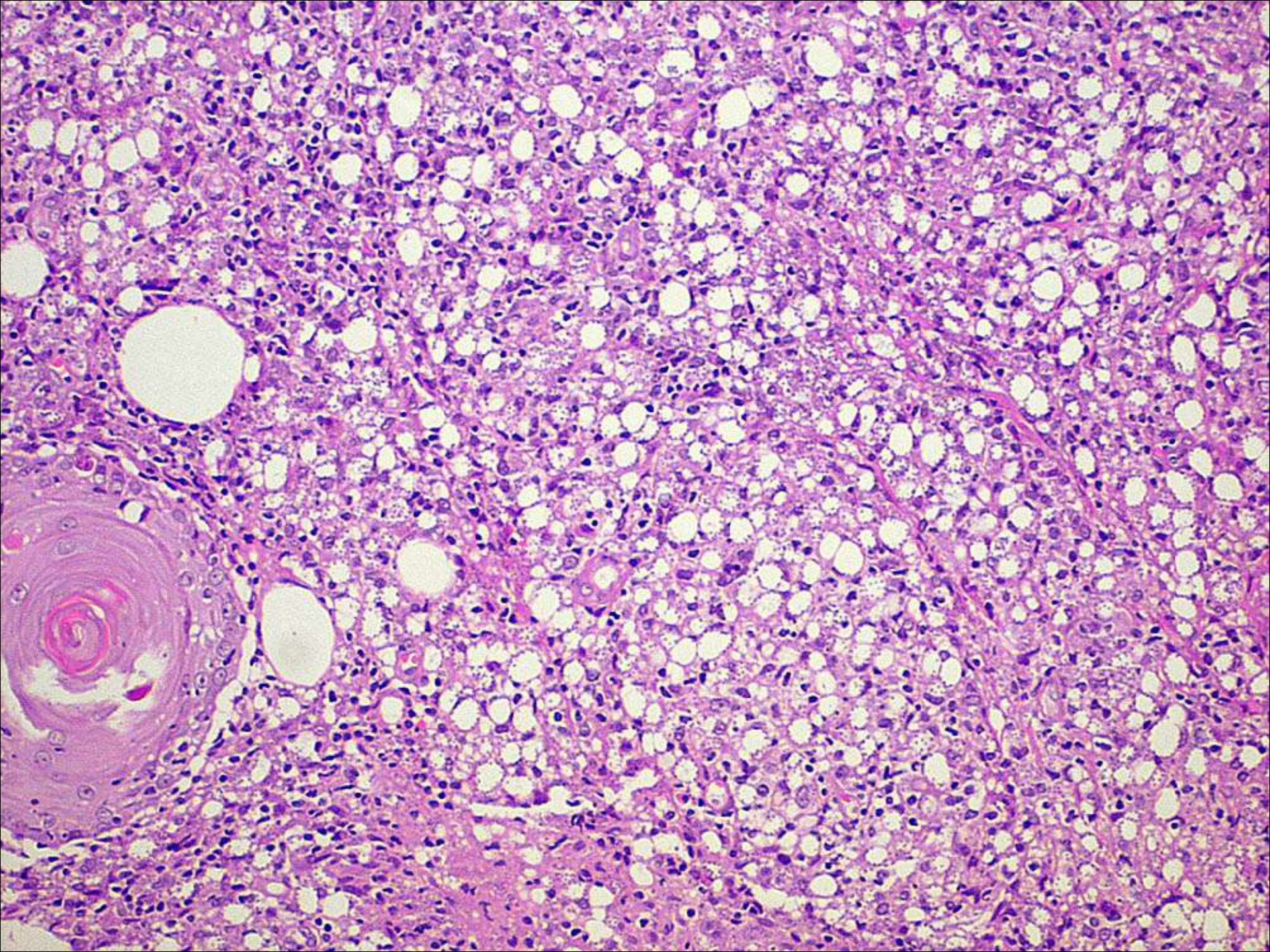
A 39 year old Saudi Arab man from Al Hasa Oasis in the Eastern Province of Saudi Arabia presented to the Dermatology Clinic of Dhahran Health Center of Saudi Aramco Medical Services Organization.

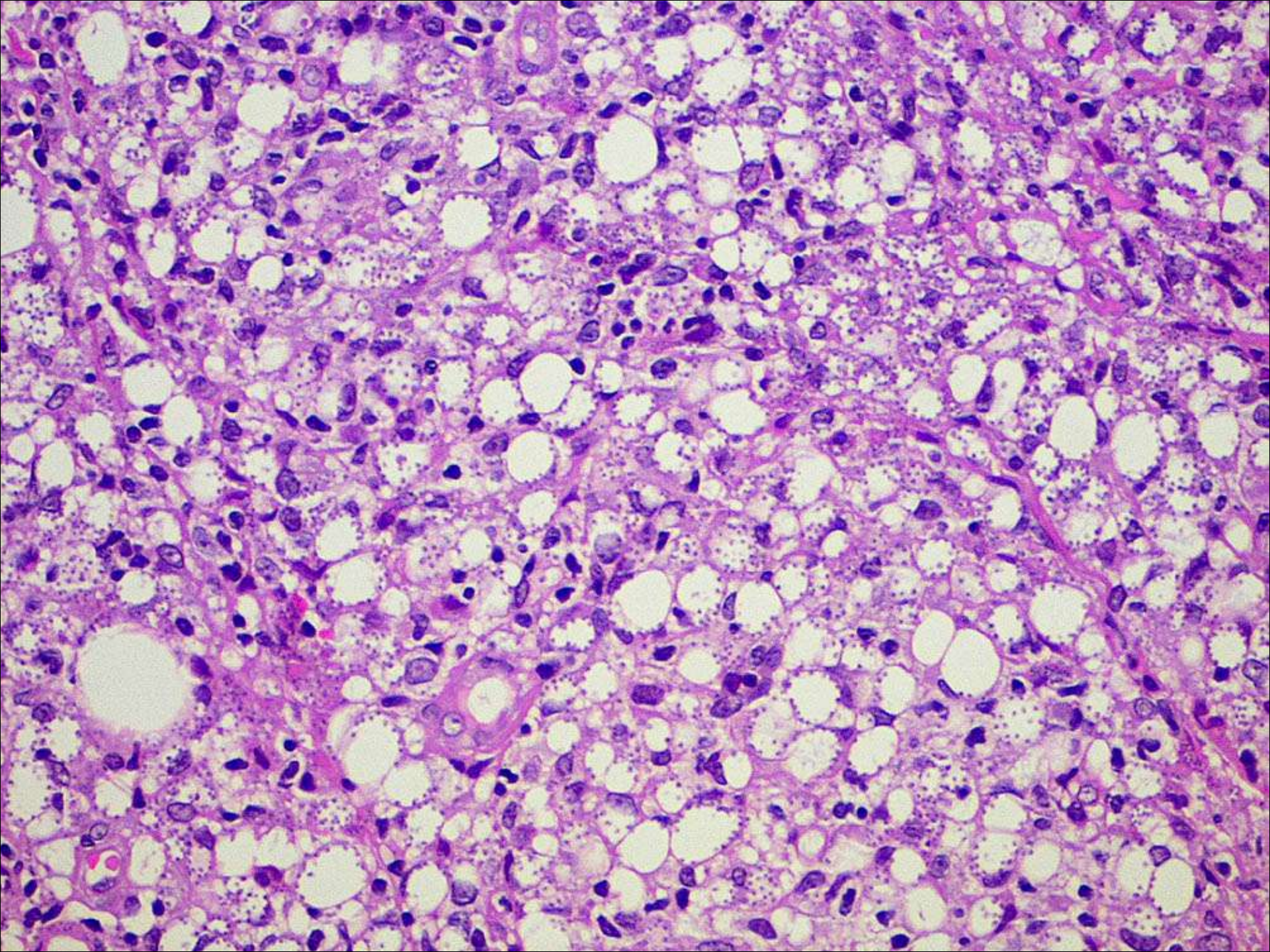
He had an erythematous ulcerating papule about 25 mm in diameter over the left cheek.

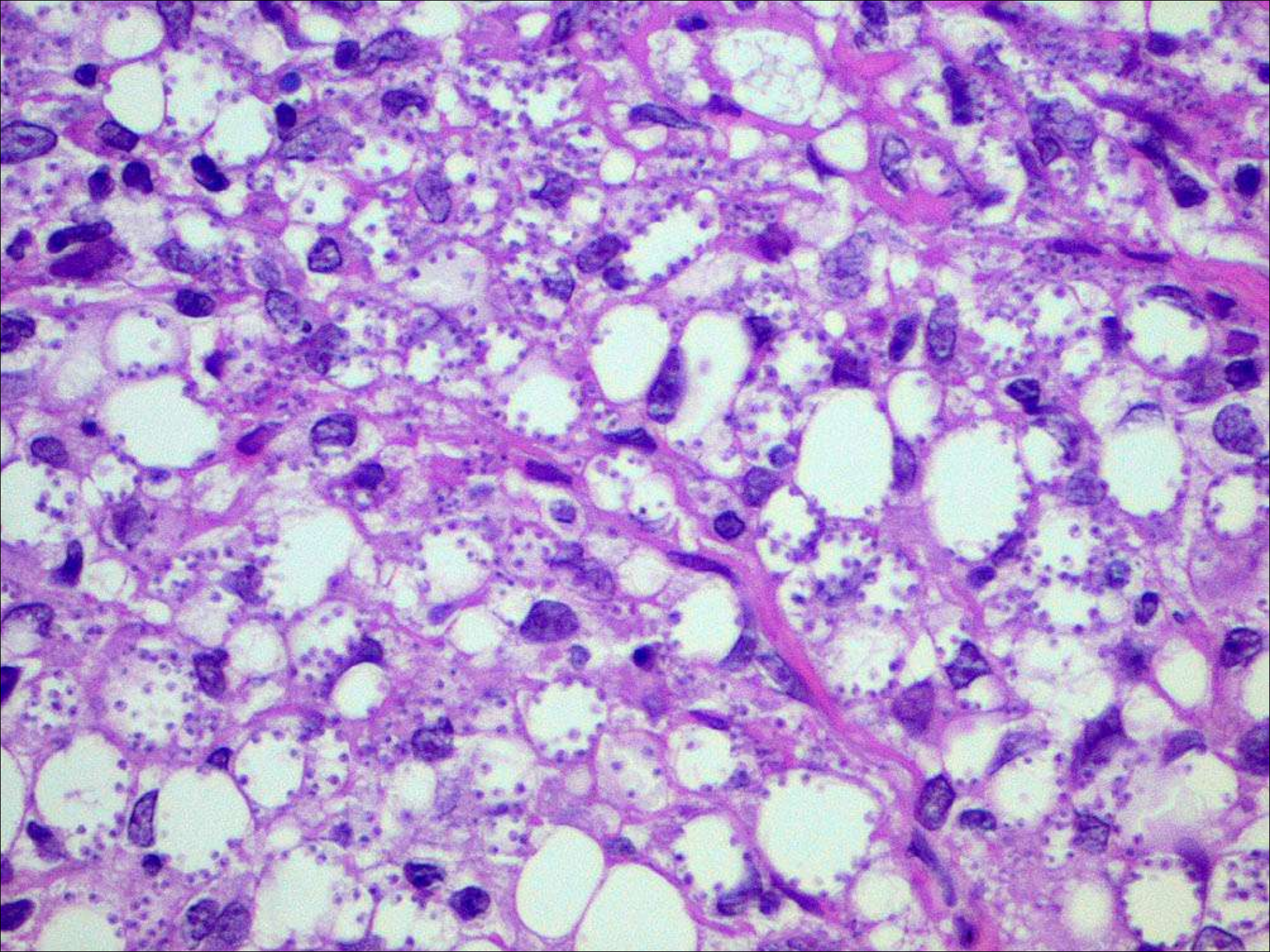
The lesion had been enlarging slowly for the last three weeks.

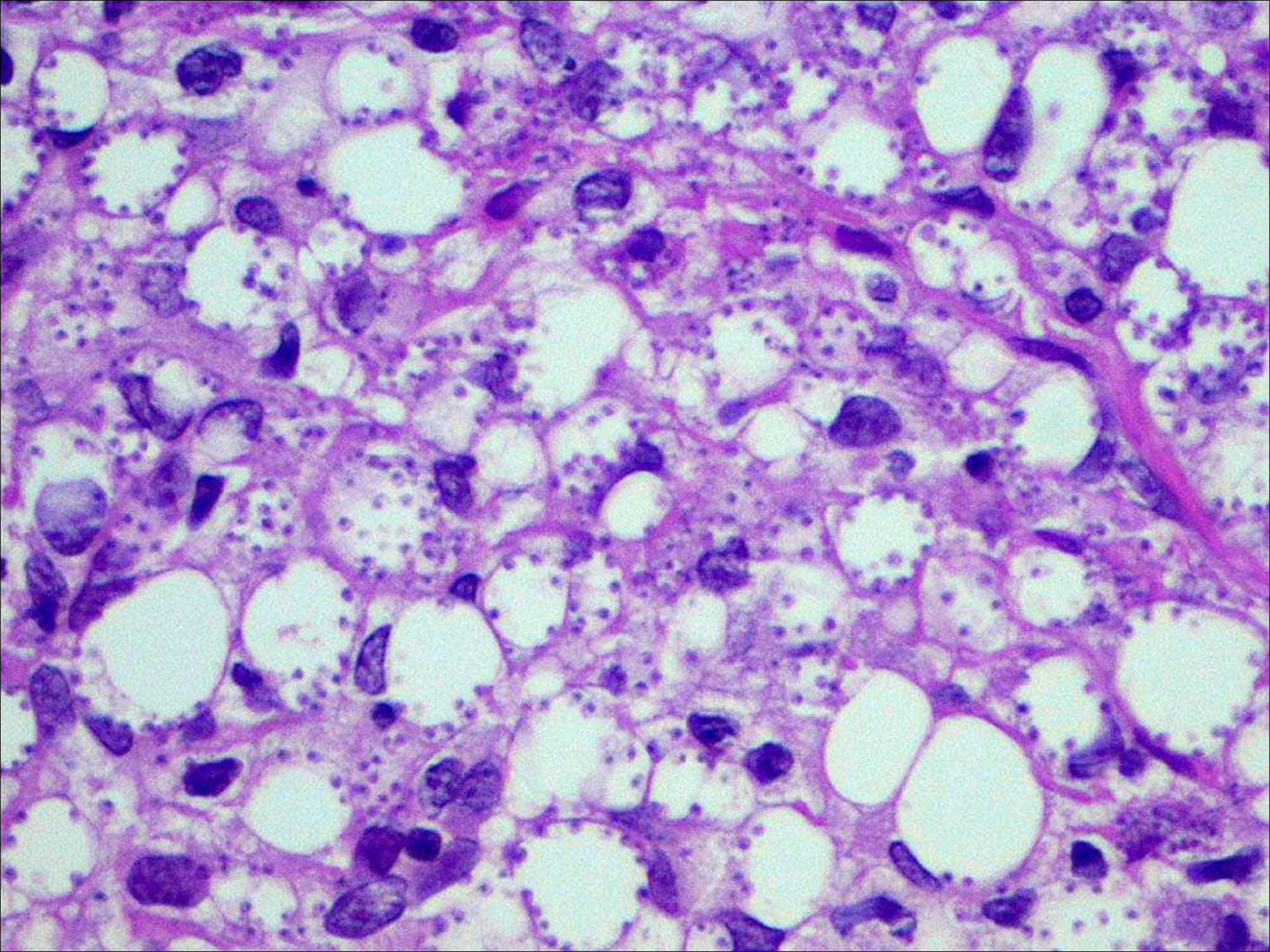
A 3 mm punch biopsy was obtained.











Case 2 has a heavy infiltration of histiocytes containing large numbers of organisms.

This reaction indicates a low level of immunity to the infection.

In Saudi Arabia the zoonotic cutaneous leishmaniasis is caused by *L. major* (Zymodeme LON-40)

It is endemic in the agricultural areas and oases of central and eastern regions.

Desert rodents serve as reservoirs and the vector is *Phlebotomus papatasi*.

It can be identified by histology
and culture

but more sensitive PCR is now
available.